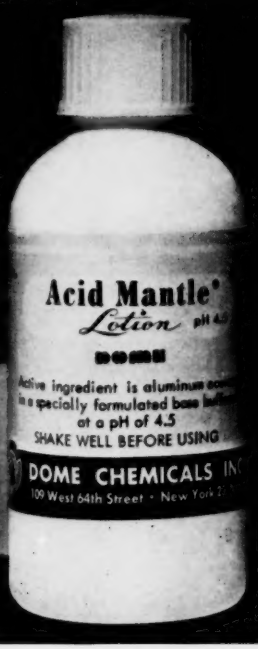
INDUSTRIAL MEDICINE AND SURGERY

Volume 25 MAY 1956 Number 5

Why Acid

for hand eczema?



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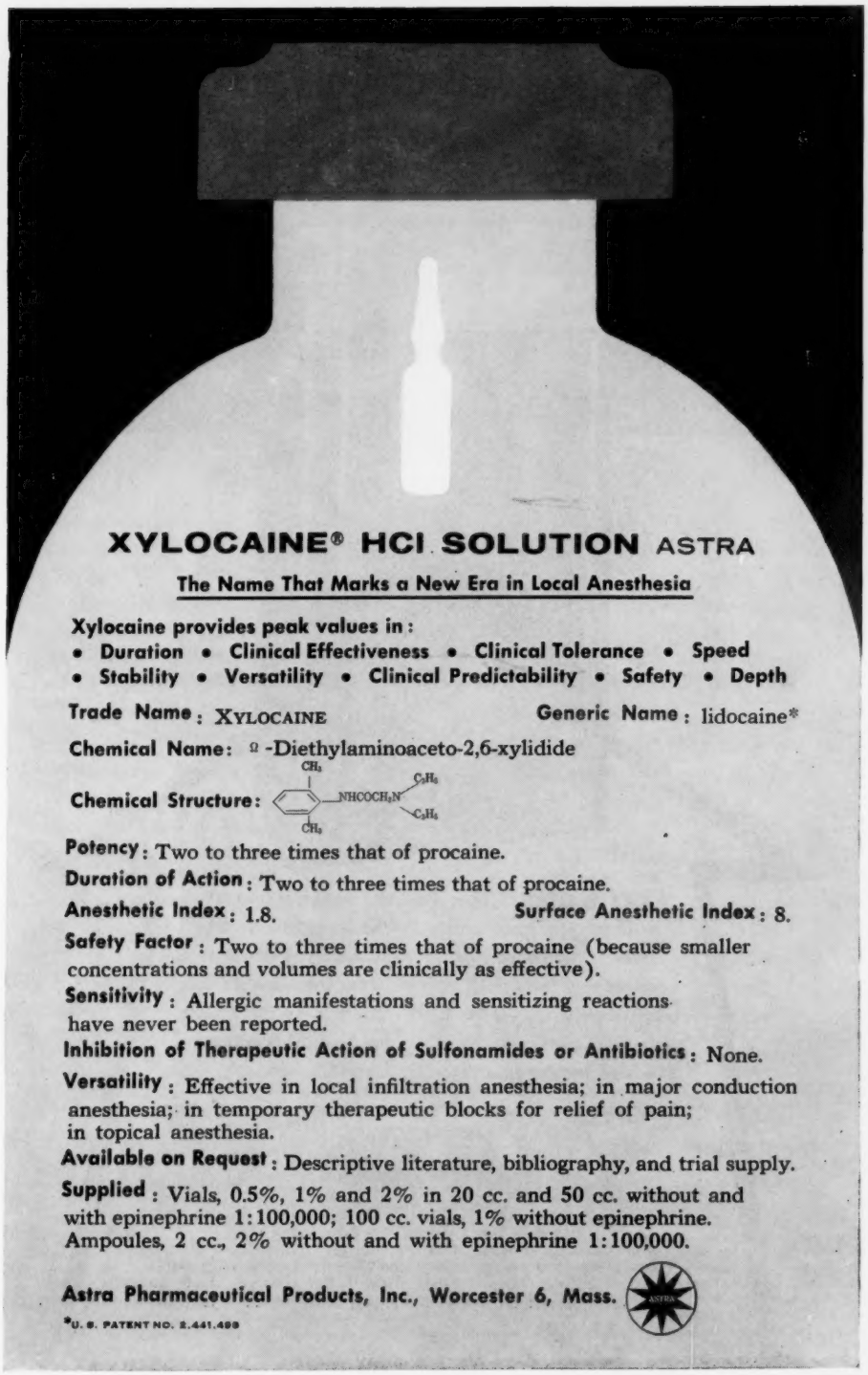

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This Journal is dedicated to the advancement of sound industrial medicine, including the surgery of industrial trauma. To that end its varying contents will embrace scientific papers, reports, digests, news items and official statements, together with editorial comment. The editorial policy is to avoid undue censorship. Some contributions ably prepared will be published although contravening the personal opinions of the editors. Care will be exercised in checking the accuracy of known facts, as printed, but in all other respects statements and opinions are those of the author and may not be shared by the editors. On any article, the editors reserve the right to comment favorably or otherwise, in the current or any subsequent issue. On this basis, contributions are invited. The opinions expressed in any contributions, including the editorials of this Journal, do not necessarily reflect the attitude or opinions of any associated organization.

Volume 25 MAY, 1956 *Number 5*

CONTENTS

The Practice of Medicine in an Industrial Society 201
W. P. Shepard, M.D.

Safe Handling of Toxic Materials by the Pest Control Operator 205
Warren A. Cook

Management and Scope of Treatment in the Surgical Department of a Large Industry 213
Norman C. Meyer, M.D., and Richard J. Bennett, M.D.

Cavalcade of Medicine 215

Medical Aspects of Automation—Influence on Industrial Medical Programs 216
C. Richard Walmer, M.D.

Award to Management—Pennsylvania Railroad Cited for Health Achievement 221

Maintaining Emotional Health—Menninger Foundation Seminar for Industrial Physicians:

Psychiatric Treatment—Somatic Methods 227
Paul E. Feldman, M.D.

Rehabilitation of the Emotionally Ill 229
Clement C. Vickery, M.D.

Psychiatric Treatment—Brief Psychotherapy Procedures for the Industrial Physician 232
Leonard E. Himler, M.D.

The Traumatic Abdomen 237
J. P. Cogley, M.D.

President's Page 242
E. S. Jones, M.D.

Editorials 243
Specialty Certification Through Examination; Industrial Medicine's Size

Associations 4, 6, 8, 10, 12

Personal News 6, 8, 10, 12, 14, 16

News, Comment, Opinion 41

Advertiser's Index 48

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B. DIXON HOLLAND, Colonel, Medical Corps, United States Army, has been appointed Secretary of the Council on Industrial Health of the American Medical Association. He will assume this position about the middle of July. COLONEL HOLLAND was born in 1910 in Texas; graduated M.D. from the University of Texas School of Medicine, Galveston in 1934. Following internship, he went into active duty as Army Medical Officer, "Health Officer and Doctor," with the Civilian Conservation Corps, 1935-36. Since January, 1937, he has been Medical Officer in the regular Army. Since July, 1955, he has been Medical Director of the Army Federal Civilian Employees' Health Service and Chief of Preventive Medicine and Assistant Surgeon, Aberdeen Proving Ground, Maryland.

ADELAIDE ROMAINE, M.D., Medical Director, Federal Reserve Bank of New York, has an article on "Alcoholism in Industry" in *J. Am. Med. Women's Assoc.*, March, 1956.

PERIODIC physical check-ups help detect cancer at Ford Division of Sperry Rand Corporation, New York. BENJAMIN N. BERG, M.D., Medical Director, said a six-year program—set up in cooperation with the County Medical Society and the American Cancer Society—turned up six cases of cancer, and "scores" of pre-cancerous and many other conditions needing medical attention.

—Industrial Relations News, March 24, 1956.

HARRY E. TEBROCK, M.D., is Chairman, JAMES H. MCDONOUGH, M.D., is Vice-Chairman, and NORMAN PLUMMER, M.D., is Secretary of the Section on Industrial Medicine and Surgery of the Medical Society of the State of New York. The Section program at the 150th Annual Meeting of the Society, May 7-11, 1956, Hotel Statler, New York, includes: (1) "Environmental Cancer and its Relationship to Industry, the Physician, and the Community"—ROBERT E. ECKARDT, M.D., Director, Medical Research Division, Esso Research and Engineering Company; (2) "Medical Problems in the Use of Atomic Energy in Industry"—ROY E. ALBERT, M.D., Chief, Medical Branch, Division

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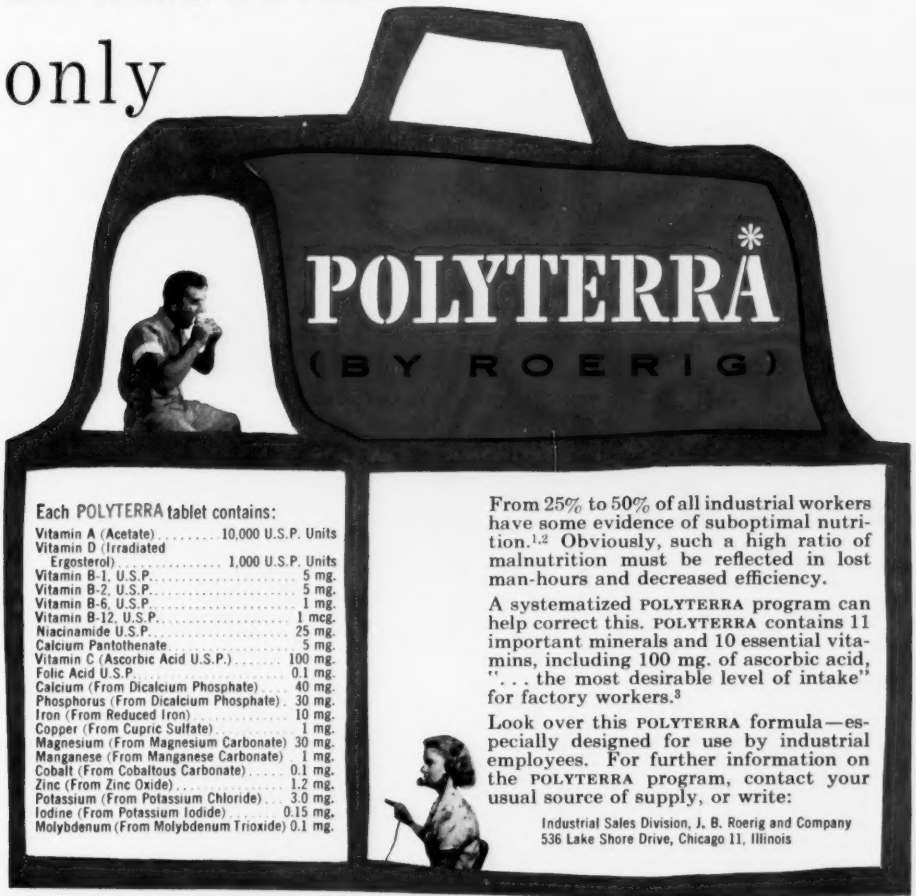

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1. Babcock, M. J., et al: Milbank Mem. Fund Quart.: 32:323 (Oct.) 1954. 2. McLester, J. S. and Darby, W. J.: Nutrition and diet in health and disease. W. B. Saunders and Company, Philadelphia, 1952, p. 584. 3. Pollack, H. and Halpern, S. L.: Therapeutic Nutrition, National Research Council, publication 234, 1952, p. 37.

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GERRITT W. H. SCHEPERS, M.D., Director of the Saranac Laboratory, Saranac Lake, New York, at the 22nd Annual Meeting of the American College of Chest Physicians, Chicago, June 7-10, 1956, will present a study of "Industrial Pulmonary Fibrosis—Its Influence on the Pulmonary Circulation: Histo-pathological Aspects."

A SYMPOSIUM on Medical Aspects of Vehicle Accident Prevention will be held at New York University-Bellevue Medical Center, May 23, 1956. This Symposium is sponsored by the New York University-Bellevue Medical Center in cooperation with the Committee on Public Health of the New York Academy of Medicine, the New York State Industrial Medical Society, and local medical societies. The day meetings will consist of panel workshops at the University Medical Center; the evening meeting will convene at the New York Academy of Medicine. The speakers for the evening session include: HERMAN E. HILLEBOE, M.D., Commissioner of Health, State of New York; W. P. SHEPARD, M.D., Chairman, Council on Industrial Health, American Medical Association; and HOWARD A. RUSK, M.D., Professor and Chairman, Department of Physical Medicine and Rehabilitation, New York University College of

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A SYMPOSIUM on the common cold was held February 17 at the Hotel Commodore, New York City. A panel consisting of the members of the Scientific Advisory Committee of the Common Cold Foundation discussed present-day research on the common respiratory diseases and the progress that is being made. DR. YALE KNEELAND, JR., Associate Professor of Medicine, Columbia Uni-

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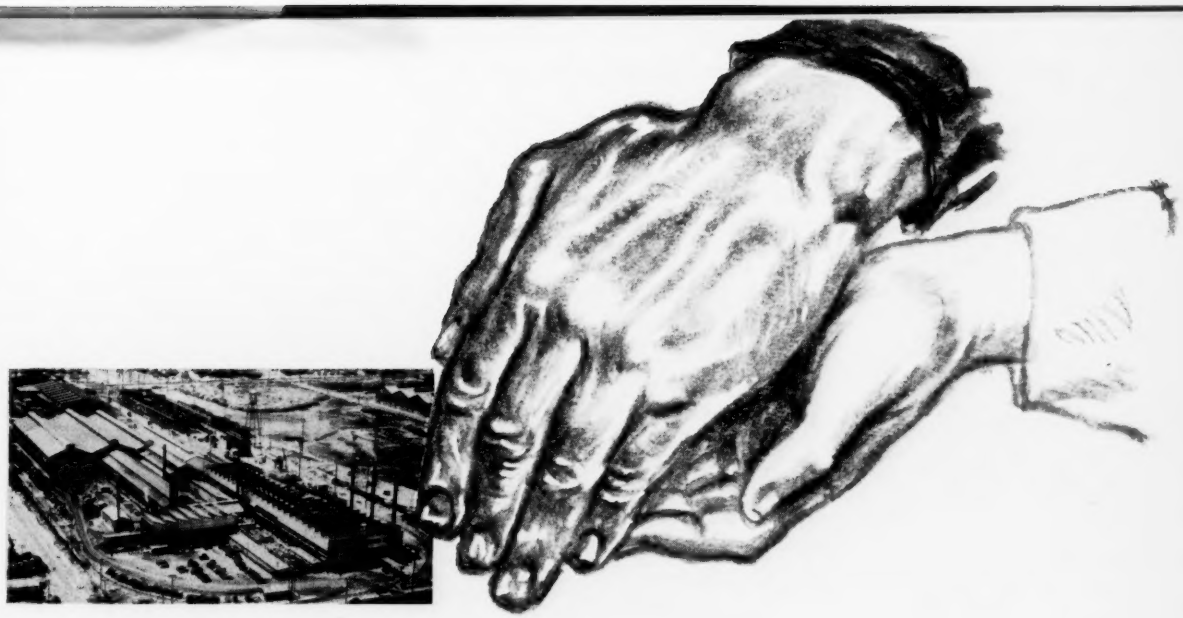

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versity, and Chairman of the Scientific Advisory Committee of the Foundation, and DR. MELVIN N. NEWQUIST, Medical Director of the Texas Company and Chairman of the Medical Advisory Committee, presided as Co-Chairmen of the Panel.

THE THIRD Annual Workshop in Industrial Nursing will be held May 25 and 26 at the University of Oklahoma Medical Center in Oklahoma City. Theme will be "Contemporary Developments in Occupational Health." Subjects include: "The Atom in Industry," "Frontline Psychiatry on the Job"; "Nursing in Disasters," and "The Cardiac and Workmen's Compensation." Among the speakers: HARRY LEVINSON, Ph.D., Director, Department of Industrial Mental Health, Menninger Foundation, Topeka, Kansas; DONALD J. BIRMINGHAM, M.D., Chief Dermatologist, Occupational Health Field Headquarters, U.S. Public Health Service, Cincinnati; MISS KATHARINE A. LEMBRIGHT, Assistant Executive Secretary, American Nurses Association, New York; MAJOR MARGARET A. RICHEY, Chief Nurse, U.S. Air Force Hospital, Bergstrom Air Force Base (Strategic Air Command) Austin, Texas. The Workshop is being sponsored jointly by the University of Oklahoma School of Medicine through its Office of Postgraduate Instruction, the Industrial Nurses Section of the Oklahoma State Nurses Association, and several sponsors from industry.

KANSAS CITY INDUSTRIAL MEDICAL ASSOCIATION held a meeting April 3, 1956, at the premises of the Kansas City Power and Light Company. Feature of the meeting was the presentation to CARL H. BRUST, M.D., Manager of the Company's Medical Department, of the OHI Certificate of Health Maintenance. Most of the members of the Kansas City Industrial Medical Association were present as well as representatives of the Power and Light Company's management, and of the local unions. The presentation was made at a complimentary dinner which was served by the Company. TERRY LILLY, M.D., introduced HANS W. LAWRENCE, M.D., IMA Second Vice-President, who described the significance and importance of the OHI Certificate. DR. LAWRENCE, in turn, introduced KIEFFER DAVIS, M.D., IMA President, who made the presen-

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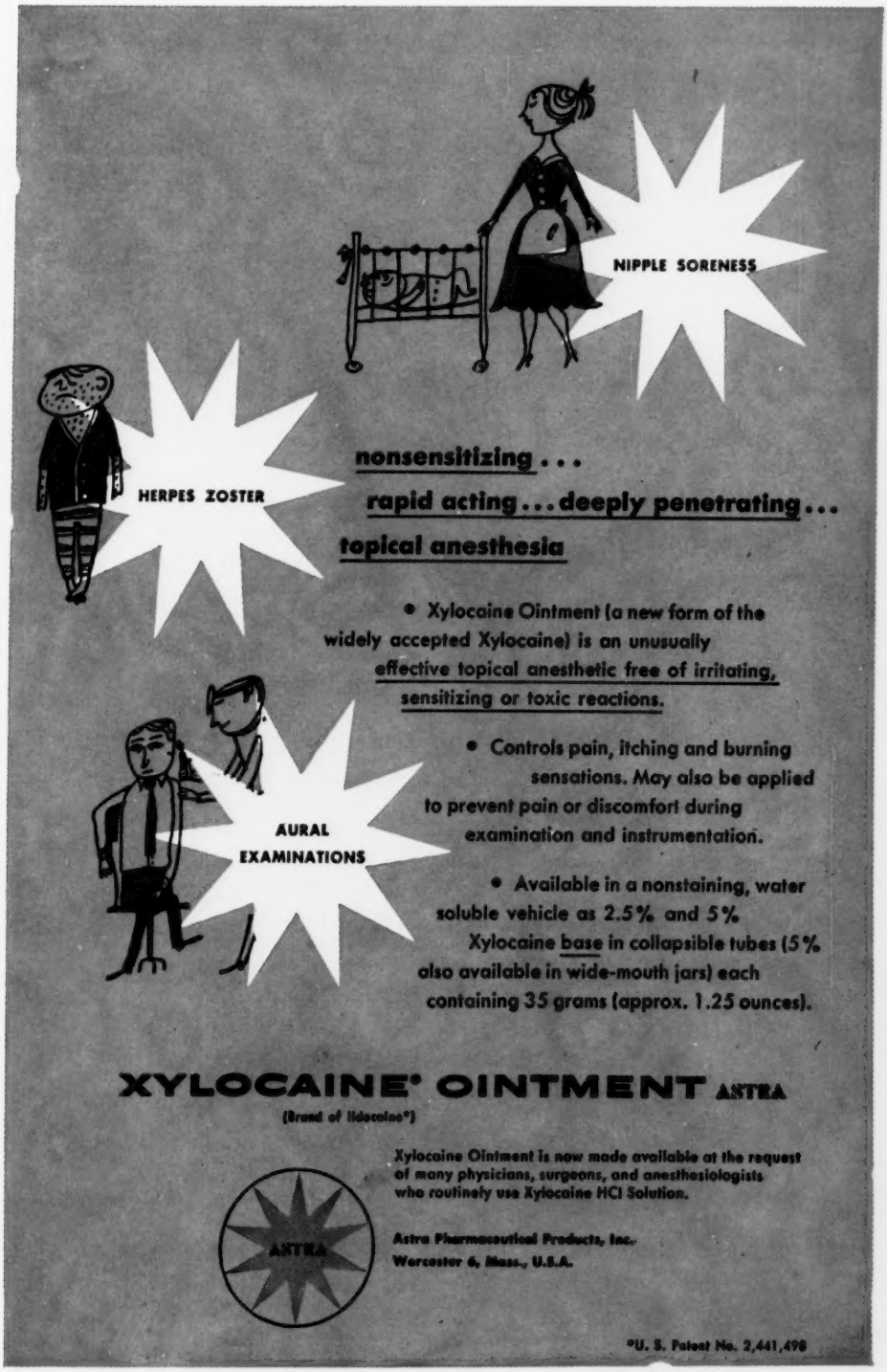

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*U. S. Patent No. 2,441,498

tation of the Certificate to DR. BRUST. Among those at the dinner were J. HARVEY JENNETT, M.D., President of the Jackson County Medical Association, and W. H. PAUL, W. E. BLACKBURN, and CARL DOUGHTY, Union representatives. At the business meeting the following were approved for active membership: M. B. CASEBOLT, M.D., Kansas City, Missouri; JAMES D. GOUGH, M.D., Chanute, Kansas; OTTO L. HANSON, M.D., Topeka, Kansas; EMERY J. McINTIRE, M.D., Webb City, Missouri; and KENNETH L. SHIREMAN, M.D., Kansas City.

JEROME W. SHILLING, M.D., Medical Director, Pacific Telephone and Telegraph Company, Los Angeles, presided on March 21, 1956, at a one-day Conference of Local Medical Consultants, Southern California area. This Conference was held to develop closer liaison between Medical Consultants, the Medical Department, and company management. Two-score physicians and a dozen or so management representatives attended. Among them were: J. S. CANTLEN, Vice-President and General Manager, Los Angeles; C. S. BROOKS, M.D., El Centro; WILLIAM GIBBS, M.D., Glendale; GERALD DOBEL, M.D., Santa Ana; THOMAS M. HEARN, M.D., North Hollywood; H. V. BRIESEN, M.D., Los Angeles; PETE LOUSTAUNOU, General Personnel Manager; P. H. DICKINSON, M.D., San Diego; W. L. MORTENSEN, M.D., Santa Monica; TRAVIS WINSOR, M.D., Los Angeles; ALBERT H. RODI, M.D., Los Angeles; L. J. YAMSHON, M.D., Los Angeles; ARMAS MANNING, M.D., Los Angeles; J. J. STEORTS, Area Personnel Supervisor; C. G. JOHNSON, M.D., Long Beach; PACKARD THURBER, JR., M.D., Los Angeles; EDITH RELYEA, Assistant Ben. Secretary, Los Angeles; I. C. WHITEHEAD, M.D., Los Angeles; EARL THEE, JR., M.D., Los Angeles; J. H. BONE, Rees-Stealy Clinic, San Diego; R. L. WATSON, JR., M.D., Los Angeles; L. G. NELSON, Secretary Employee Benefit Committee, Los Angeles; C. C. GREEN, M.D., San Francisco; W. Z. BARO, M.D., Los Angeles; PHILIP HODGKIN, El Centro; EDMUND BRIGGS, Personnel Director, Los Angeles; LOUIS CELLA, M.D., Santa Ana; H. D. HOSKINS, M.D., Oceanside; JAMES M. HUNTER, M.D., Ventura; JOHN MILLER, M.D., Anaheim; J. P. WESTERGART, M.D., Van Nuys; R. M. KERSTEN, M.D., San Bernardino; M. JOHNSTONE, M.D., Pasadena; JOHN LAYMAN, M.D., Pasadena; EUGENE SIVE, M.D., Santa Ana; JOSEPH BOYES, M.D., Los Angeles; C. H. CASSIDY, M.D., San Diego; ORWYN ELLIS, M.D., Los Angeles; ROBERT BLOCH, M.D., San Pedro. Among the presentations were "Philosophy, Purpose and Objective of Preplacement Examinations," by E. J. ZAIK, M.D., and "Miscellaneous Problems Encountered in Preplacement Examinations," by C. E. LEUSCHNER, M.D.

NEW ENGLAND INDUSTRIAL MEDICAL ASSOCIATION held its Annual Spring Meeting in Meriden, Connecticut, March 28, 1956. This meeting was co-sponsored by the Meriden Plant of the New Departure Division, General Motors Corporation, and the Committee on Industrial Health of the Connecticut State Medical Society. In the afternoon a tour was made through the Meriden Plant of New Departure's production facilities and Medical Department. The members of the plant staff of New Departure served as guides. At the banquet provided by the management of New Departure, the Plant Manager, MR. HARRY T. BURGESS, discussed the organizational structure of General Motors and of the New Departure Division, and the role of the Medical Department in the organization. DAVID H. GOLDSTEIN, M.D., Medical Director, *New York Times*, delivered the speech of the evening on the subject of "In-Plant Medical Programs, Today and Tomorrow," relating the present accomplishments of industrial medicine to the trends of the future. The meeting was largely attended by members from the New England area.

THE THIRD Annual Pacific-Northwest Industrial Health Conference will be held in Portland, Oregon, September 10 and 11, 1956.

ALLEGHENY County, Pennsylvania, is to have its first Department of Health, to be organized by a five-man Board of Health appointed March 13, 1956, by the County Commissioners. This Board includes: "D. JOHN LAUER, M.D., Medical Director of Jones & Laughlin Steel Corporation since 1951; a specialist in industrial medicine, preventive health and in-plant health programs; a former Assistant Professor of Industrial Medicine at the University of Cincinnati; and the President of the County Cancer Society."

Local Medical Consultants, The Pacific Telephone and Telegraph Company, Southern California Area.

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to give optimal therapeutic results

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elasticity for compression • body for support

B-D BECTON, DICKINSON AND COMPANY, RUTHERFORD, N. J.

B-D AND ACE, T.M. REG. U.S. PAT. OFF.

A certificate in recognition of the excellence of the health services for employees was awarded by the Occupational Health Institute to the Kansas City Power & Light Company at a meeting April 3. At left are Robert L. King, Director of Industrial Relations, and Carl M. Brust, M.D., Medical Director, Kansas City Power & Light Company. Making the presentation are Kieffer Davis, M.D., Medical Director, Phillips Petroleum Company; H. W. Lawrence, M.D., Medical Director, The Procter & Gamble Company, and Terry E. Lilly, Jr., M.D., Kansas City, Missouri.

A CONFERENCE on Industrial Mental Health was held in Minneapolis, March 26, 1956 under the sponsorship of the Minnesota Academy of Occupational Medicine and Surgery and the Minnesota Association for Mental Health. HARRY M. LEVINSON, PH.D., Director of Industrial Mental Health, Menninger Foundation, Topeka, Kansas, was the keynote speaker. He was assisted by eight Twin Cities psychologists and psychiatrists in presentation of the program. *Minneapolis Tribune* commented as follows: "Minnesota's first Conference on Mental Health in Industry tackled some fundamental problems about human beings this week. It revealed a growing awareness of the emotional disturbances usually behind a worker's bad performance on the job. And it gave recognition to the need for such satisfactions as security, self-respect, responsibility and a chance to get ahead—desires common to practically every person, regardless of the nature of his job. Experts who spoke at the Conference pointed out the great loss to business and industry resulting from unsatisfactory performance by employees. They emphasized the fact that the boss who sees a worker begin to slip and looks for the real cause can help both the individual and the company. As with any other kind of illness, the sooner the symptoms of emotional disturbance are spotted, the faster the comeback can be. The Minnesota Association for Mental Health and the Minnesota Academy of Occupational Medicine and Surgery which sponsored the meeting, have done a service in focusing attention on these problems and in encouraging leaders in the field to learn more about the solutions."

KENNETH E. DOWD, M.D., President of the Aero Medical Association, at its 27th Annual Meeting, at Chicago, in April, announced the establishment of the Aero Medicine Medal, an annual award to be presented for the outstanding contribution to basic research in aviation medicine. The award, consisting of a bronze medal and a $500 honorarium, is sponsored by Pfizer Laboratories, a Division of Charles Pfizer & Company, Inc., Brooklyn, New York, pharmaceutical firm. DR. LUDWIG LEDERER, Chairman of the Association's Awards Committee stated that in choosing the recipient of the award primary consideration would be given to scientific papers published in the *Journal of Aviation Medicine*. He noted, however, that such publication would not be required for a scientific contribution which the Committee members judged to be of outstanding merit.

UNIVERSITY of Miami School of Medicine, after examination by the survey team of the Liaison Committee on Medical Education and Hospitals and the Association of American Medical Colleges, is now an approved school and its graduates in June will have full rights of licensure and the opportunity to accept internships in approved hospitals.

ASSOCIATION of Ordnance Industry Physicians was organized at the Ordnance Ammunition Command, Joliet Arsenal, Joliet, Illinois, in February, 1953. The membership is limited to Medical Officers who are employed at Arsenals and other Ordnance plants which operate under the direction of the Office of the Chief of Ordnance. There are approximately 65 of these throughout the country—including government owned-contractor operated plants. The Association is unincorporated; its aim is to increase the quality of preventive medical service rendered in plants under the direction of the Chief of Ordnance. On April 27 and 28, this Association held a seminar at Frankford Arsenal at the close of the Industrial Health Conference.

Deaths

MATT TINLEY, M.D., 80, at Council Bluffs, Iowa. Dr. Tinley was President of the American Association of Railway Surgeons, 1938-39.

CECIL K. DRINKER, PH.D., 69, retired Dean of the Harvard School of Public Health, at Falmouth, Massachusetts, April 15, after a long illness. DR. DRINKER was one of the country's leading authorities on industrial hygiene.

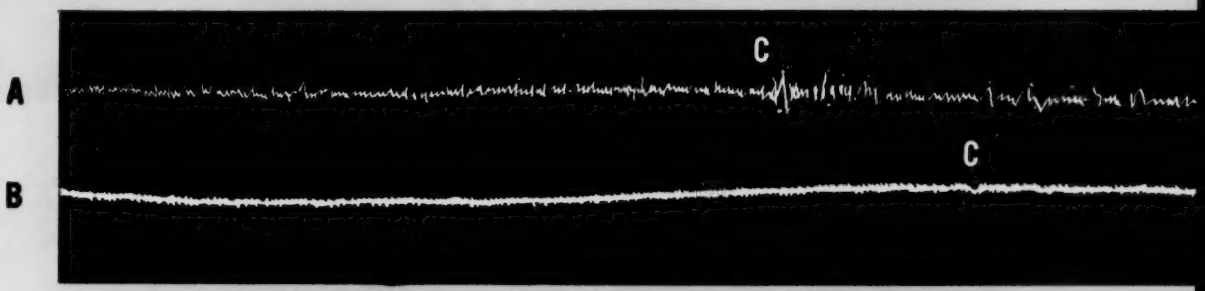
CLARENCE W. HENNAN, M.D., 61, on February 28, 1956 at Chicago. DR. HENNAN was a 1917 graduate of the Chicago College of Medicine and Surgery; member of the Industrial Medical Association through Central States Society; IMA Fellow, 1947. He had been Medical Director of Schulze Baking Company, F. H. Noble & Company, Kroger Grocery & Baking Company, and surgeon for other companies. His collection of the Netherlands postage stamps was described as the largest in the world. He was President of the Chicago Collectors Club, and Past-President of the Chicago Society of Industrial Medicine and Surgery and the staff of Jackson Park Hospital. He had headed the American and Chicago Philatelic Societies, and was a Fellow of the Royal Philatelic Society of London.

Reduces Muscular Tension

Equanil*

MEPROBAMATE
(2-methyl-2-*n*-propyl-1,3-propanediol dicarbamate)
Licensed under U.S. Patent No. 2,724,720

Electromyography shows decisive response



Electromyographic study of neuromuscular hyperactivity in 42-year-old male with anxiety-tension syndrome. A, Before EQUANIL; action potential of high amplitude and frequency. B, After one week of ambulatory treatment with EQUANIL; showing definite reduction in tension, greater ability to relax, and marked improvement in muscular coordination. C, Point where patient makes effort to relax.[1]

The remarkable effectiveness of EQUANIL may be demonstrated in two ways. One is by its ability to relieve muscle spasm and neuromuscular tension.[1] The second is by its ability to relieve mental tension and anxiety.

Usual dosage: 1 tablet t.i.d. The dose may be adjusted either up or down, according to the clinical response of the patient.

Supplied: Tablets, 400 mg., bottles of 50.

1. Dickel, H.A., et al.: West. J. Surg., April, 1956.

anti-anxiety factor with muscle-relaxing action . . . relieves tension

*Trademark

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Philadelphia 1, Pa.

All the

Multiple Compressed Tablets 'Co-Deltra' and 'Co-Hydeltra' are unique among the dosage forms of the newer steroids, because they are specifically designed as a tablet within a tablet to provide stability and to release in sequence, antacid and anti-inflammatory agents . . .

1. the outer layer of antacids (aluminum hydroxide gel and magnesium trisilicate) comes into contact with the gastric mucosa first . . . and after it is completely dissolved . . .

2. *the hitherto intact inner core* containing the anti-inflammatory agent (either prednisone or prednisolone) then begins to release its full therapeutic potential . . . and not before.

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Multiple Compressed Tablets

'Co-Deltra'

Prednisone Buffered

benefits of prednisone and prednisolone plus positive antacid action to minimize gastric distress...

A reportedly higher incidence of gastric distress in patients receiving the newer steroids prednisone and prednisolone indicates the desirability of co-administering non-systemic antacids.[1]

To help the physician cope with this problem of gastric distress which might otherwise become an obstacle to therapy with the newer steroids . . . Multiple Compressed Tablets 'Co-Deltra' (Prednisone Buffered) and 'Co-Hydeltra' (Prednisolone Buffered) are now available.

'Co-Deltra' and 'Co-Hydeltra' are now available in bottles of 30 on your prescription. Each Multiple Compressed Tablet contains:

Prednisone or Prednisolone, 5 mg.; 300 mg. of dried aluminum hydroxide gel, U.S.P., and 50 mg. of magnesium trisilicate.

'Co-Deltra' and 'Co-Hydeltra' are trade-marks of Merck & Co., Inc.

1. Bollet, A. J., Black, R., and Bunim, J. J.: *J.A.M.A.* **158**: 459, June 11, 1955.

'Co-Hydeltra'

Prednisolone Buffered

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Division of Merck & Co., Inc.

a new substance

in a variety of rheumatic disorders...

"an 85% over-all effectiveness"[1]

the first orally effective lissive[‡]

three or four times d

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ets (250 mg.), bottles of

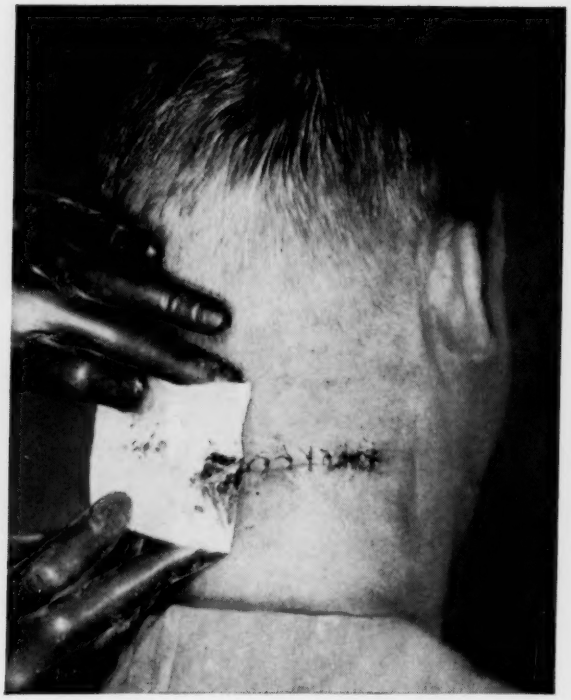
m without interference with normal

for true spasmolysis
of skeletal muscle

McNEIL

OFFICE...OR...CLINIC

TELFA Strip is ideal for minor wounds, burns and plastic cases. Easy to apply. Doesn't hurt or tear the scab when you take it off. Convenient sizes—and they can be cut to fit any wound, without raveling.



Note easy and painless removal of TELFA dressing on 6th day after excision of neck tumor. The healing tissue and stitches are undisturbed, no sign of irritation. Wound is dry and healing is well advanced.

WHATEVER THE WOUND, DRESS IT WITH TELFA

Wounds heal faster with a TELFA Non-Adherent dressing. Doesn't stick... and doesn't hurt when you take it off

Now you can dress any wound with TELFA—wounds that you have heretofore dressed with gauze, or with sponges and pads.

TELFA is now available in two forms: TELFA Non-Adherent *Strips*, for simple, minor wounds and the new TELFA Non-Adherent *Sponge-Pads* for all routine surgical wounds and even for drainage cases.

This means that you can now employ the advanced TELFA *technique throughout your dressings practice. And save up to 41% on dressings costs.*

Because of its perforated "plastic skin" that goes next to the wound, TELFA absorbs drainage without sticking to the wound. Removal is simple, painless and does not disturb healing tissue or stitches.

Result: you get fast, *primary* healing . . . as well as less patient discomfort.

Nature heals best when healing tissue is not disrupted. Use TELFA *routinely.*

TELFA Strips, in 2″ x 3″ and 3″ x 4″ sterile envelopes; bulk cases in 2½″ x 4″, 3″ x 8″ and 8″ x 10″. TELFA Sponge-Pads, in 4″ x 5″ and 5″ x 9″ pads.

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TELFA®

NON-ADHERENT
STRIPS OR SPONGE-PADS

BAUER & BLACK
DIVISION OF THE KENDALL CO., CHICAGO

in skin traumas...

Rapid healing of tissue

Speeds the return to work

Sept. 25. Second and third degree burns caused by flaming gasoline. Gauze pressure dressings of Vitamin A and D Ointment were changed at weekly intervals.

Oct. 25. Healing is complete, with minimal scar tissue and no contractures.

White's Vitamin A and D Ointment

—The topical application of White's Vitamin A and D Ointment—to promote healthy granulation and rapid epithelization—is particularly valuable in the treatment of burns, abrasions and traumatic lacerations. Other indications include chafing, sunburn, slow-healing ulcers and bedsores. White's Vitamin A and D Ointment presents the A and D vitamins in the same ratio as found in cod liver oil, in a pleasant, soothing, lanolin-petrolatum base. White's Vitamin A and D Ointment will not stain the skin and is easily laundered from clothing. Keeps indefinitely at ordinary temperatures.

SUPPLIED: 1½ OZ. AND 4 OZ. TUBES, 1 LB. AND 5 LB. JARS.

White Laboratories, Inc. Kenilworth, N. J.

in rheumatoid arthritis

STANDING

is easier with STERANE[1]—3-5 times more active than hydrocortisone or cortisone.[2]

WALKING

follows rapidly.[1] STERANE "is more effective than any previous drug in the control of...rheumatoid arthritis."[3]

WORKING

functional mobility is restored even where other steroids fail or cease to be effective.[2,3]

WITH MINIMAL DISTURBANCE

of electrolyte balance[1-3]—patients may even be treated without diet restrictions.

Sterane®

brand of prednisolone

supplied: *White, 5 mg. oral tablets, bottles of 20 and 100. Pink, 1 mg. oral tablets, bottles of 100.*

1. Spies, T. D., et al.: GP 12:73, No. 1, 1955. 2. Boland, E. W.: J.A.M.A. 160:613, 1956. 3. Gillhespy, R. O.: Lancet 2:1393, 1956.

PFIZER LABORATORIES Division, Chas. Pfizer & Co., Inc. Brooklyn 6, New York

What goes up in a puff of smoke?

When a smoker buys a pack of cigarettes, he simply acquires the means for making puffs of smoke.

Naturally, he wants to get his money's worth. Every puff should taste great . . . rich, fresh, clean and mellow. And every puff should taste just the same as every other puff.

Lucky Strike gives him such enjoyable puffs largely because the scientists in the Research Laboratory of The American Tobacco Company know so much about puffs of smoke.

Every day a laboratory smoking machine takes hundreds of puffs on hundreds of Luckies. The smoke is then broken down chemically and examined. By this method the scientists make sure not only that Lucky puffs contain the enjoyable elements but that they contain them always in the same quantity. This is one of many excellent reasons why Lucky Strike is the cigarette of matchless quality.

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the soothing, protective, healing[1-4] *influence of*

DESITIN®
OINTMENT

is persistent

because it adheres longer to the skin areas being treated . . . does not liquefy or crumble at body temperature, nor is it decomposed by secretions, perspiration, exudate, urine, or excrement.

Non-sensitizing, non-irritant Desitin Ointment . . . rich in cod liver oil . . . has proven clinically dependable for over a quarter century in . . . **diaper rash • eczemas intertrigo • wounds** (especially slow healing) **external ulcers • perianal dermatitis**

Tubes of 1 oz., 2 oz., 4 oz., and 1 lb. jars.

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1. Grayzel, H. G., Heimer, C. B., and Grayzel, R. W.: New York St. J. M. 53:2233, 1953.
2. Heimer, C. B., Grayzel, H. G., and Kramer, B.: Archives of Pediatrics 68:382, 1951.
3. Behrman, H. T., Combes, F. C., Bobroff, A., and Leviticus, R.: Ind. Med. & Surg. 18:512, 1949.
4. Turell, R.: New York St. J. M. 50:2282, 1950.

when your patient complains that the pain of neuritis is unbearable,

THORAZINE*

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allay his suffering

'Thorazine' acts not by eliminating the pain, but by altering the patient's reaction—enabling him to view his pain with a serene detachment. Howell and his associates[1] reported: "Several of [our patients] expressed the feeling that ['Thorazine'] put a curtain between them and their pain, so that whilst they were aware that the pain existed, they were not upset by it."

Smith, Kline & French Laboratories, Philadelphia

1. Howell, T.H., et al.: Practitioner 173:172 (Aug.) 1954.

*T.M. Reg. U.S. Pat. Off. for chlorpromazine, S.K.F.

'Thorazine' should be administered discriminately; and, before prescribing, the physician should be fully conversant with the available literature. 'Thorazine' is available in ampuls, tablets and syrup (as the hydrochloride), and in suppositories (as the base).

Avoid maceration!

NEW **BAND-AID** PLASTIC STRIPS!
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protect skin from whitening and shriveling

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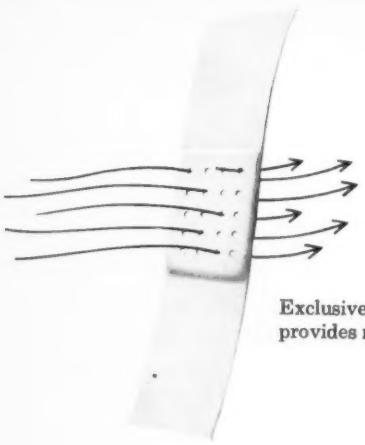
Proved in over 90% of clinical tests.



Exclusive, patented feature
provides maximum aeration.

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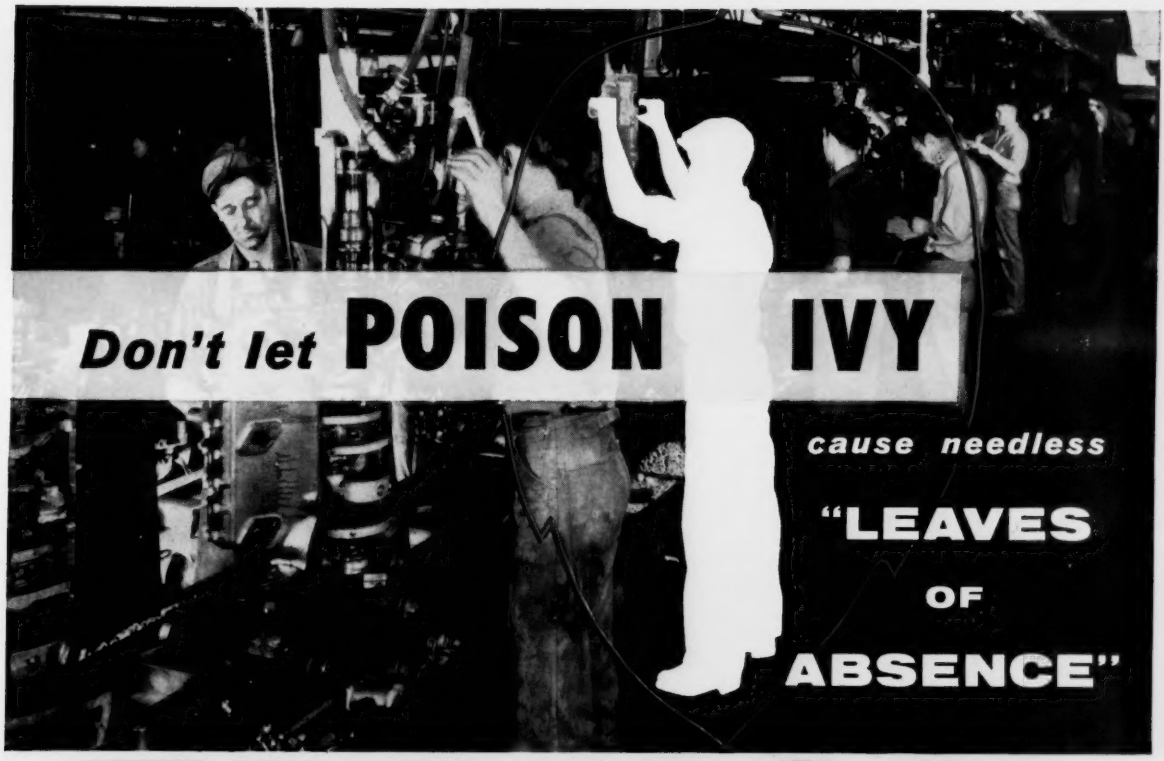

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PREVENTION: Effectively wards off poison ivy, poison oak, poison sumac
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Calcium Disodium VERSENATE*

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NOW IN 2 DOSAGE FORMS

Write for descriptive booklet.

INTRAVENOUS Complete instructions for dilution and administration accompany the ampuls. The average daily dose for an adult is 1 to 2 Gm. per day, given as two infusions. For children, the dose is not more than 0.5 Gm. per 35 pounds of body weight, given once or twice daily. Boxes of six 5cc. (1 Gm.) ampuls.

ORAL Average adult dose is 8 tablets (4 Gm.) per day, in divided doses. For children, the dose is adjusted on the basis of 2 tablets (1 Gm.) per 35 pounds of body weight daily, in divided doses. For ease of administration tablets may be crushed and dissolved in milk. In bottles of 250 tablets, each containing 500 mg.

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Brand of trichloroethylene U.S.P. (Blue)

"Duke"® University Inhaler

No. 3160 Model-M

FOR SELF-ADMINISTERED INHALATION ANALGESIA

IN OBSTETRICS

IN MINOR SURGERY

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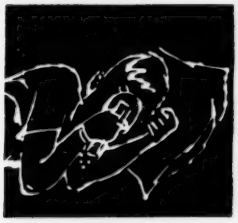

■ Notably safe and effective

"Trilene," self administered with the "Duke" University Inhaler, under proper medical supervision, provides highly effective analgesia with a relatively wide margin of safety.

■ Convenient to administer

The "Duke" University Inhaler (Model-M) is specially designed for economy, facility of handling, and ready control of vapor concentration.

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- Induction of analgesia is usually smooth and rapid with minimum or no loss of consciousness
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"Trilene" *alone* is recommended only for analgesia, not for anesthesia nor for the induction of anesthesia. Epinephrine is contraindicated when "Trilene" is administered.

"Trilene" is available in 300 cc. containers, 15 cc. tubes.

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Ointment (3%) with Hydrocortisone (2%)

An excellent salve for the relief of inflammation and soreness in many kinds of skin conditions, as well as for the prevention and treatment of infection in cuts, wounds, and abrasions. Does not burn or sting. As an anti-infective, use it wherever you would use iodine.

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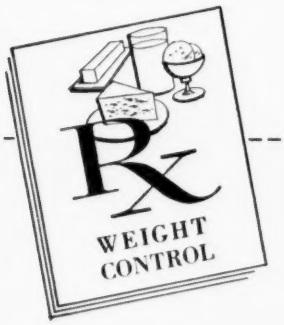
mirror, mirror, on the wall...



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Medically supervised research on weight reduction shows active, overweight adults losing 1½ to 2 pounds per week on a diet of appetizing meals featuring a variety of foods which provide all nutrient needs except calories—and which also satisfy hunger. Persons on such diets maintained pep and sense of well-being, reported no hunger pangs . . . but shed excess pounds!

These diets contain approximately equal weights of protein, fat, and carbohydrate. Fat combined with protein in a meal delays hunger—for it reduces stomach motility and gastric juice secretion, promotes slower digestion, and makes possible a more gradual absorption of nutrients.

Foods included in these diets provide all essential nutrients in amounts recommended for adults. Only calories are in deficit. Dairy foods are an important feature of these meals because of their high proportion of nutrients in relation to the calories they provide. Their taste appeal and variety make the diet easy to follow until desired weight is lost.

Doctors! Send for the convenient leaflet and diet instruction sheets containing menus for three full meals a day for an entire week. Diets at two moderately low calorie levels are included. These diet instructions will be useful even where a person may require a different calorie level for weight loss. For such individuals, the physician can suggest desired modification, retaining the basic diet plan.

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S-2

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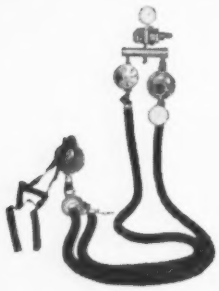
M·S·A

A COMPLETE LINE OF ARTIFICIAL RESPIRATION AND INHALATIONAL THERAPY EQUIPMENT FOR MODERN TREATMENT TECHNIQUES



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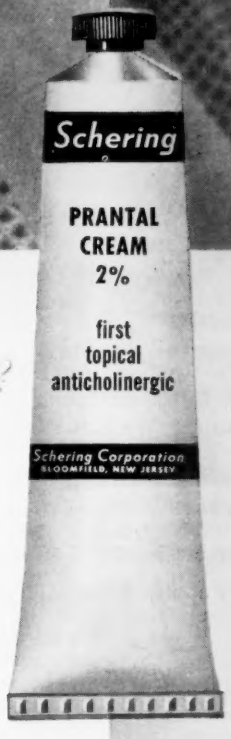

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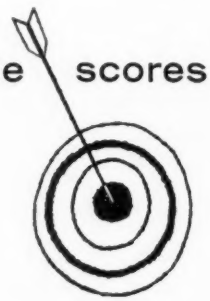

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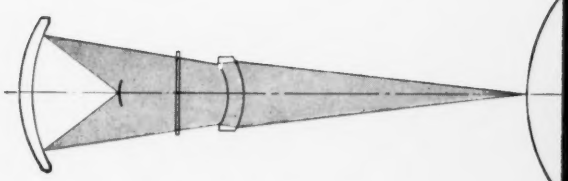

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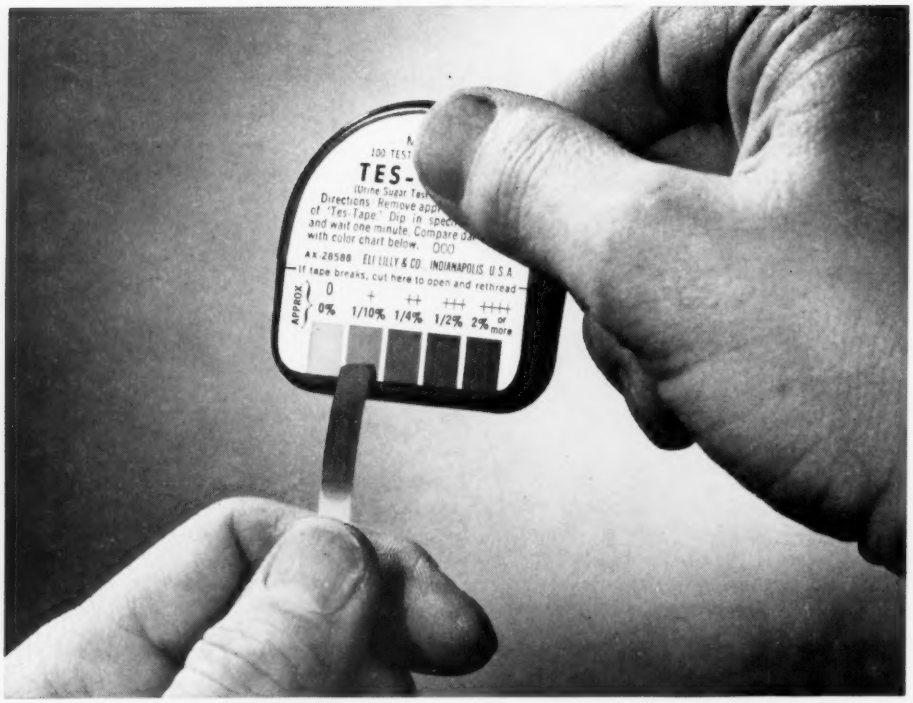

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INDUSTRIAL MEDICINE AND SURGERY
MAY, 1956

The Practice of Medicine in an Industrial Society

W. P. SHEPARD, M.D., Second Vice-President
Metropolitan Life Insurance Company, New York City

MOST OF US here today have been interested in some phase of industrial or occupational medicine for some time and have pursued these interests with some success. Most of us learned the hard way in the school of experience, without "benefit of clergy" by way of postgraduate degrees. Through a combination of circumstances which few of us could have foreseen when we started, we find ourselves in the spotlight of medical, industrial, and public interest. Someone has referred to industrial physicians as the "coming generation!"

It's a little embarrassing, this sudden spotlight. We've been through some troubles in our chosen field: originally looked upon askance by some of our own medical colleagues; expected to do impossible wonders by some industries, grudgingly tolerated by others; pioneering in a field where the traditional doctor-patient relationship was sometimes difficult to maintain; faced with problems of toxicology, trauma, prevention, therapy, and medical administration, quite unique to most physicians. The spotlight makes us wish to be sure our house is in order so that we can be justly proud of the honor of practicing the newest specialty in medicine. Let us see what needs to be done.

Growing Eminence of Industrial Medicine

WE LIVE and practice medicine today in a new era, the characteristics of which we may recognize more fully than many of our medical colleagues. They have come about through some rather recent evolutionary changes. I shall list the more important of these changes and describe the effects of some of them on medical practice and the problems they present. I shall finish with my picture of the ideal industrial physician of the future, from which you will recognize a description of many here today. I have no doubt that we can set our house in order and that we shall acquit ourselves creditably in the new position of leadership which these vast changes have thrust upon us.

Presented at a Meeting of the WESTERN INDUSTRIAL MEDICAL ASSOCIATION, Los Angeles, California, April 28, 1956. DR. SHEPARD is also Chairman of the Council on Industrial Health of the American Medical Association.

Changes Placing Medicine in a New Environment

THE CHANGES which are responsible for our new environment and which are profoundly affecting the practice of medicine have evolved gradually within the memory of most of us. As we look back and count them off, they are impressive in total.

Elsewhere I have discussed the major sociological changes which have affected the practice of medicine.[1] These are:

1. Unprecedented migration within the country, from country to city, city to suburbs; mass movements to the west coast giving California a 92% increase in population since the 1940 census.[2]

2. The enormous demand by the public for various forms of prepaid medical and hospital care so that 100,000,000 of our 165,000,000 population have now provided themselves with some form of this protection.[3] For some physicians this means that 60% of their income comes from a third party, the insurer.

3. Ruling by the courts in 1949 that "fringe benefits," including health care, might be bargained for in lieu of increased wages. Today more than 11,000,000 workers receive some such benefits at an annual cost to employers of over a quarter-million dollars.[4]

4. Because of fringe benefits, combined with mounting costs of workmen's compensation, a sudden, though still incomplete, awakening of industry to the values of an industrial medical program; hence a rapidly growing demand for physicians' services in industry. It is a demand which at the moment we are not fully prepared to meet.

There are, however, still other changes affecting our own special interests in occupational medicine. They call rather urgently for our recognition, and they challenge our professional competence and leadership.

We are surrounded by man-made hazards to life and health, the variety and extent of which were never before seen in the history of the human race.

1. Mechanization and speed have so altered our working lives that one marvels at the adaptability of the human mechanism. A jet pilot can collide

with a visible object 10 miles away before the nerve impulse can travel from retina to muscles in time to avoid it. Air passengers complain when assigned to a DC-3 because it only makes 250 miles an hour. A Univac machine will handle 200,000 transactions on 800,000 accounts with the speed of light. One operator on a hinge-bending machine can turn out 20,000 pieces a day; his grandfather at the forge did well with 200. All of these changes are blessings to mankind, but they place us and our patients in a new environment presenting dangers to human structure and function such as we have never known before.

2. The industrial uses of chemistry, engineering, and physics have produced so many new products and by-products that many are in common use before their dangerous qualities are recognized or understood. Chemists can produce and put into use a dozen new products while we painstakingly lay out a three-year research project to test the toxic qualities of one.

3. These changes are not confined to the factory or mine. Our homes and farms are mechanized and supplied with new products. They are usually to our benefit, but they bring us in close proximity with dangerous machinery, hazardous refrigerants, potentially dangerous drugs, insecticides, and other chemicals. Even our foods today often contain additives, preservatives, and contaminants which require the most careful safeguards.

4. Add to this the fact that combustion products of one kind or another are discharged into our air at an unprecedented rate, reaching for the first time in history in some areas a saturation which is uncomfortable to masses of human beings, and in a few places, and as yet on rare occasions, inimical to health and life.

5. Our streams and lakes carry a pollution load such as we have never seen before, while at the same time, especially in the west, their flow has been lessened by increased need for irrigation and water power.

6. The products, by-products, and waste-products of nuclear fission present a whole new array of man-made hazards. Their potential harm to man and all life on this earth, even in peaceful uses, almost paralyzes the imagination. It is to the everlasting credit of the Atomic Energy Commission that they recognized early the hazards with which they were dealing. They obtained competent physicists and specially trained physicians and gave them the necessary authority to install safety-control measures at the very outset. The results speak for their wisdom: an incredibly small number of deaths and injuries in this highly dangerous field. As Warren[5] says, this industry reversed the usual sequence in avoiding occupational injury by studying their hazards first and instituting control measures *before* placing their materials into general use.

7. Last but not least in this partial list of man-made hazards facing physicians today are the mental and emotional stresses of modern living. We must be prepared to be among the first to deal scientifically with the manifold disorders arising from, or aggravated by, emotional maladjustments, immaturity, and defective inter-personal relations. They are of the greatest importance to industry, affecting as they do absenteeism, accidents, inefficiency, and unhappiness in general.

Kehoe[6] says "It is not always apparent to us that this is a new, a strange, and, as yet, an inadequately explored human environment which we, as medical men, do not fully appreciate or understand; that we have a tremendous task of study, investigation, and adaptation ahead of us; and that all of the knowledge, skill, and resources of modern medicine and hygiene are being put to a more severe test of their applicability and fitness than they have been in any previous period in the history of this country."

The Increased Demand for Medicine in Industry

INDUSTRIAL or occupational medicine is finally coming into its own. We are the newest specialty in medicine. The demand for our services from both management and labor is increasing rapidly. We have already made a good start at setting our house in order by agreeing on the criteria for desirable postgraduate and residency training for those who would specialize in this field. We already have eight good training schools in this country. Can we hold the gains already made? Can we rise to the challenges before us? Can we maintain and enhance our proper position of leadership for the benefit of medicine and industry in general? I believe we can!

The Industrial Physician of the Future

TO SUPPPORT this belief let me outline briefly the qualifications and skills of the industrial physician of the future, based on present trends as I see them. Many here have already attained these qualifications and skills. Others are on their way. Some have still a long way to go, but the way will be shortened by a clear view of our objectives.

First, the physician in industry, part-time or full-time, employed by management, or unions, or both, will have a clear understanding with his employers concerning his status. He will make it clear that his primary and sole function is to apply his medical knowledge for the benefit of all, from top executive to unskilled laborer. He will do this impartially, honestly, and readily. He will expect to earn and enjoy the respect of all, and thus to have their full support. He must have ready access to top management where his recommendations will have serious and thoughtful consideration. He will expect management to subscribe to the pronouncement of the Steel Industry Board that "maintenance of the human body (of the worker) . . . is an obligation which should be fulfilled by enlightened business management . . . as one of the fixed costs of doing business, one of the first charges before profits."[4]

Second, he will recognize the importance of the profit motive, realizing that no business can long operate at a loss and that he is expected to join his special skills with all others in industry to reduce all possible loss. This involves primarily

keeping the worker healthy and happy, eliminating hazards to health and happiness, reducing disability as far as possible, within the tenets of good medical practice, and helping restore the disabled worker to maximum earning power. It demands his interest in workmen's compensation, non-occupational disability costs, absenteeism, and morale in general. He will be as much concerned with helping the worker obtain medically justified benefits as with preventing abuses of the benefit plan by unscrupulous claimants.

Third, he will study carefully the physical and mental opportunities, demands and hazards of each job category in his industry, as well as the physical and mental assets and liabilities of each worker, so that he may offer workers and management alike the unique skills of medicine in proper job placement. His objective here will be to prevent work-damage to every individual and to help attain maximum productivity and earnings for all, especially those with disabilities.

Fourth, he will cultivate friendly professional relationships with his medical colleagues in the community, never using his industrial connections to their disadvantage. All of them, regardless of their type of practice, will see illness related to occupation, even in the housewife and the farmer. Indeed, occupation has much to do with every illness: possible etiology and prevention, degree and extent of disability, psychosomatic factors, therapy, and, most important, rehabilitation. Doctors of the community will eventually develop a sense of relief when one of their patients is employed in a place where an industrial physician is available for assistance and consultation. He can provide work history, behavioral characteristics, diagnostic aids, work adjustments during or following disability, and many other aids to the attending physician. Not the least of these is to help relieve the family doctor from pressure by the patient for unnecessary and unreasonable sick leaves or hospitalization just because: "I'm insured, Doc." Frequently knowledge of such pressure on the family doctor is all the industrial physician needs to justify a heart-to-heart talk with the employee to convince him that the company doctor is there to be fair and impartial to all.

Fifth, the company doctor, full-time or part-time, will recognize the fact that health maintenance extends beyond the working environment and the eight-hour day. Community health facilities are as important to industry as industry is to the community.[7] Perhaps the most important of these facilities are the local medical and dental profession and the hospitals they staff. In addition, there is the local health department with its legal responsibility for safeguarding water, milk, and food; assuring safe methods of waste disposal; keeping vital statistics; controlling communicable diseases; safeguarding the health of mothers, infants, and school children through maternity, well-baby, and school clinics; providing health education, and focusing on special community health problems such as cancer, accidents, mental health, and chronic illness. There are also the voluntary health agencies such as those especially interested in heart disease, cancer, alcoholism, mental health, safety, family relations, etc. With all of these, the industrial physician should be well acquainted and cooperative. Their effectiveness in the community will modify and supplement his in-plant health program to an important extent.

Sixth, the industrial physician of tomorrow will be of invaluable service to management, the employee, and the local jurisdiction on workmen's compensation cases. He is in a unique position to provide the medical facts in most cases, to oppose unjustified awards, to assure justified awards, including the best of medical care and rehabilitation, and to assist the local jurisdiction with the medical administrative problems which are often so numerous and troublesome. He is in a key position to help the local medical society meet its obligation to work with the state and local workmen's compensation boards.[8,9]

Seventh, he will look upon his industrial health program as the place par excellence for the practice of preventive medicine. Nowhere else—not even in private practice, in clinics, or in school health work—will he find such opportunities for the prevention of disability and the promotion of positive health. From the first preplacement physical examination, through the continuous observance of the individual's reaction to his various jobs, through the periodic health examination including the reasonably accurate health history, on through the inexorable changes wrought by the aging process, until the final examination prior to retirement, the industrial physician is engaged primarily in preventive medicine.

Eighth, he will find and develop opportunities to pursue special interests such as gastro-enterology; traumatic surgery; cardiology; disturbances of the special senses, particularly vision and hearing; pulmonary function; dermatology; and many fields about which we all need further enlightenment. Statistical studies require only a good record system plus time and interest. His opportunities for research in longitudinal studies of health, productivity, degenerative diseases, psychological phenomena, morbidity, and mortality are unparalleled. We know all too little about health education, why it works, and why it doesn't, what are the best methods of improving what people think and what they do about their health.

Ninth, the part-time industrial physician will lay out a program of in-service training for himself which will serve to keep him abreast of more rapid changes than are occurring in any other field of medicine. He will read texts and periodicals which keep him informed, demand that short courses be arranged by the Industrial Health Committee of his medical society, and attend them regularly. He will have it understood with his employer that it is to their mutual advantage for him to attend at least one professional meeting a year devoted to occupational health, and that this will be at company expense.

Tenth, and last, should this part-time man be-

come sufficiently interested to devote full-time to this new specialty in medicine, he will arrange his affairs so that he may obtain formal training at one of the recognized schools and residencies and will prepare himself for the specialty board examinations.

Conclusion

TO SOME this may seem an impossibly idealistic picture. To them I would point out that we are already a considerable distance toward its accomplishment. A surprising number of physicians are already doing part-time industrial work of one kind or another. Circulation of scientific journals on occupational health is increasing. Attendance of physicians at meetings such as those of the Industrial Medical Association and the annual Congress on Industrial Health increases each year. More and more medical research in industry is appearing in our non-specialized journals.

The demand for medical service in industry is here and is growing rapidly. It is here to stay. The success of any important movement depends upon the people, in this case the physicians, who go into it.

We who have been in this field for some years are in the spotlight. We must lead the way. We cannot, nor would we, stop the current trend. Whether we impede it or hasten it depends on our devotion to the cause and our willingness to work together toward these worthy objectives.

(One Madison Avenue.)

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Personality Tests

PSYCHOLOGICAL tests help prevent placement of overqualified technical personnel in jobs that readily can be handled by workers with less formal training. Companies find tests provide objective criteria for weighing skills, thus reducing the tendency for supervisors to overestimate training required for a particular job. Widespread acceptance of psychological tests is indicated by the fact that over 70% of the companies in chemical and process industries use them for chemists and engineers, according to a recent survey by *Chemical & Engineering News*. Ways in which tests prove of value to firms studied include: serve as systematic, objective and rapid means of screening potential employees. Twenty-five years of testing experience at Procter & Gamble, for example, indicate that men who hold responsible positions in the company today made high test scores at the time of employment; most dependable tests are in the area of mental ability, they correlate well with grades in college and other indices of potential; tests provide basis for comparison of marking standards of different schools; interviewers can concentrate on applicant's personal qualities, when achievement tests are administered; applicants appreciate the care the company takes in screening new employees; knowledge that tests are given keeps many unqualified workers from applying at firms. Limitations of psychological testing, according to firms surveyed, include: tests measure what persons can do, not what they will do; are not too successful in measuring variables such as creativity and thoroughness in work habits; personality and interest tests are subject to faking. High scores on personality tests have not always proved consistent with characteristics shown after employment; laymen tend to overemphasize test scores at expense of other tools for evaluating personnel.

—*Industrial Relations News*, April 7, 1956.

Safe Handling of Toxic Materials by the Pest Control Operator

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University of Michigan, Ann Arbor

PESTICIDES can be handled without extermination of the pest control operator. They need not even cause the slightest deterioration in his health. In order to direct the toxic action of these materials exclusively to the pest, be it mite, mosquito, rat or mouse, the pest control operator should be informed on the toxic properties of the pesticides and on the safe method of handling them.

The industrial physician in any plant where control of insects or rodents is being undertaken and physicians in any area where such operations are being conducted should be alerted to the pesticides being applied. This precaution will assist the physician to be completely prepared in event an emergency should arise.

The pest control officer must observe proper precautionary measures both in the formulation of the pesticide preparations within his place of business and in the application of them at his client's premises. These two phases of his operations are discussed separately, together with a review of the toxic properties of the pesticides.

Handling Pesticides on Operator's Premises

THE handling of pesticide materials by pest control operators at their establishments varies to a considerable extent. These operations usually involve mixing the poisonous substances with the bait and may include diluting concentrates with inert powders or liquids, transfer of pesticides from shipping containers in which these are received to smaller containers or mixing equipment, and placing materials in solution or preparation of emulsions.

All of these operations may involve possibility of absorption of toxic material by the operator, the principal route being through the respiratory tract, whether a dust, vapor or gas, and to a lesser extent and dependent on the nature of the material through the skin. Or through some accident, the entry into the body might be through swallowing some of the substance.

The effect of excessive exposure might be immediate irritation, as can occur to the eyes when a solution with xylene as the solvent is being introduced into a container and the operator is close to the filling device or the operation is being conducted in a small unventilated room.

From a paper presented at the University of Michigan School of Public Health Inservice Training Course for Pest Control Operators.

A cumulative action might occur if moderately excessive exposures to carbon tetrachloride as the solvent should be continued or repeated over a period of time, even though no noticeable discomforting symptoms were evident. This action might be on the liver or the kidneys, and records even over recent years include fatal cases in connection with such operations as cleaning electrical equipment and metal parts in confined places and without appropriate ventilation.

These and other solvents and many of the pesticides could also cause dermatitis. Occupational skin conditions are always annoying and can be serious.

Our examples have been taken from the group of solvents rather than the pesticides themselves as there has been more extensive experience with these than with many of the pesticides. But let us review briefly what the hazards are and something of the experience with a number of the more commonly used pesticides.

Chlorinated Hydrocarbons

OF THE newer insecticides, more is known of DDT than of the other members of the group of chlorinated hydrocarbons both as to animal experimentation and effect on humans. As an indication of the interest of public health people in this substance, a joint session on Pesticides was held by the Engineering, Epidemiology, Food and Nutrition, and Industrial Hygiene Sections of the American Public Health Association at its Annual Meeting.

The present status of our knowledge of DDT intoxication was presented by a man whose name is well known to PCO's—Dr. Wayland D. Hayes, Chief, Toxicology Section, Communicable Disease Center of the Public Health Service. Though DDT has been in general use in this country since 1946 and there is some suggestion of insect resistance to it, this compound continues to be produced in larger amounts than any other single insecticide. Cases of acute DDT poisoning uncomplicated by other substances have been described with symptoms including headache, dizziness, tremor, and convulsions, with recovery well advanced within 24 hours except in the most serious cases. Dr. Hayes stated that "there is no well-described case of fatal, uncomplicated DDT poisoning." However, it is to be recalled that the 1951 report of the American Medical Association Committee on Pesticides listed some 364 cases of poisoning alleged to have resulted from DDT preparations, including 14 fatal cases. These were obtained from many sources, included some 22 suicide attempts and not only systemic poisoning but 57 cases

of dermatitis. Cases of dermatitis have occurred as a result both of exposure to DDT alone and to solutions of it. There have been reports of a number of deaths from swallowing DDT solutions, with the symptomotology of solvent poisoning being predominant.

Since the Communicable Disease Center makes an effective effort to receive and check on all reports of pesticide injury cases in this country, Dr. Hayes' observation made at the October APHA meeting that "no instance of chronic DDT poisoning in man has been confirmed" is to be accepted as authoritative.

Reports that DDT is the cause of a variety of diseases have been investigated and no substantiating evidence was found. However, instances of poisoning were uncovered by a reputable investigator where there was excessive and careless occupational exposure. Consequently, although the experience with DDT has been good, it is to be emphasized that careless habits should not be permitted to cause unnecessary exposures to this or other toxic pesticides. DDT has been shown to be safe under present conditions of use, but it carries little comfort to be told that one has an occupational disease only because he has been more than usually careless in his handling of a moderately toxic material that over past years has not caused injury to very many men!

The experience with chlordane has not been as favorable. The Committee on Pesticides of the American Medical Association has reported a group of 15 cases of poisoning with five deaths.

As a measure of the relative toxicity of DDT and others of the commonly used chlorinated hydrocarbon insecticides, the tentative threshold limit values adopted by the American Conference of Governmental Industrial Hygienists in April 1955 might be noted.

The measure of a safe maximum exposure to DDT over an eight-hour day is 2.0 milligrams per cubic meter of air. The comparable values for other insecticides in this group are as follows:

Compound	Milligrams per cubic meter of air
Aldrin	0.25
Dieldrin	0.25
Lindane	0.5
Pentachlorophenol	0.5
Chlordane	2.0
Methoxychlor	15.

The effects of aldrin and dieldrin on the body are closely related. Symptoms of poisoning in man include headache, nausea, and dizziness with convulsions sometimes followed by coma in more severe poisoning. Animals have shown convulsions as much as 120 days after the last dose of dieldrin sufficient to cause severe poisoning. As should be done with all of these insecticides which penetrate the skin, any dieldrin which comes in contact with the skin should be thoroughly washed off with soap and water. By no means should clothing damp with such compounds be allowed to remain in contact with the skin.

Exposure to high concentrations of lindane and such decomposition products as may result from overheating in a vaporizer has resulted in headache, nausea, and irritation of eyes, nose and throat. The effects on the body are closely similar to those of DDT. Four cases of poisoning occurred where children had consumed a home-made soft drink containing lindane which had been mistakenly mixed with sugar. These all had convulsions but recovered uneventfully. Not so a 5-year-old girl who drank 4.5 grams in a 30% solution of an unspecified organic solvent. Following convulsions, she died.

Organic Phosphates

PEST CONTROL operators have not employed the very toxic members of the organic phosphate group such as parathion and TEPP. A much less toxic compound of this group, for which the common name "malathion" has been approved, became commercially available a year and a half ago and since May of last year has found an increasing use as a fly killer. As a comparison of the toxicity of malathion with that of parathion, the American Conference of Governmental Industrial Hygienists in April, 1954, approved a tentative threshold limit value of 15 mg/cu. meter for malathion as against 0.1 mg/cu. meter for parathion. It is to be noted that two or three times more malathion is required than is necessary for parathion in order to obtain comparable results in its use.

Only one report of clinical poisoning ascribed to this compound has come to our attention. This might have been a fatal case had not the cause been recognized and proper therapy applied. The effects are the same as those of other organic phosphates. The inhibition of the enzyme cholinesterase permits accumulation of large amounts of acetylcholine. When a critical level of cholinesterase depletion is reached, severe symptoms and death may result. Although much the same care should be followed in handling malathion as is observed with other organic phosphates, it is not absorbed significantly through the skin and its vapor pressure is so low that inhalation of vapor from the cold liquid does not cause excessive absorption provided adequate hygienic measures are observed.

Another organic phosphate, diazinon, also of lesser toxicity than the earlier members of this group, has recently been approved by the U. S. Department of Agriculture, though for limited use. The ACGIH has not assigned a tentative threshold limit value to this compound. The acute oral LD/50 for rats is approximately 100 to 150 mg. per kilogram, as compared with 3 mg. per kg. for parathion and 1845 mg. per kg. for malathion. Thus diazinon would be considered a thirtieth as toxic as parathion but twelve to eighteen times more toxic than malathion. If this pesticide is to be used, the technical bulletin available for the producer should be obtained and the application techniques together with precautions included in this bulletin should be meticulously followed.

Even more recent has been the proposal that a chlorinated organic phosphate may come into use in view of its demonstrated high effectiveness for houseflies. It has been recommended for use in dairy barns and other areas outside the home. This material has the common name "dipterex." Competently conducted toxicity studies have shown dipterex to have a relatively low mammalian toxicity. The acute oral toxicity of dipterex is 450 mg. per kg. It would thus take 150 times more dipterex than parathion to cause acute poisoning on ingestion, but only ¼ as much as malathion.

Of the insecticides in the following table, it is to be noted that only the first two have been ascribed even tentative values by the American Conference of Governmental Industrial Hygienists as safe exposures over an eight-hour day. On the basis of acute oral dose, chlorthion, the most recent of the organic phosphates placed on the market, appears to be of the same order of toxicity as malathion.

Compound	Milligrams per cubic meter of air	Acute Oral Approx. LD/50 mg./kg. for rats
Parathion (included for comparison)	0.1	3
Malathion (99% technical)	15.	1845
Diazinon		100 to 150
Dipterex		450
Chlorthion		1500

Other Organic Compounds and Botanicals

OF A NUMBER of other insecticides in use by PCO's may be mentioned Strobane, which is recommended for household pests and which has a toxicity, both acute and chronic, of about twice that of malathion.

Piperonyl butoxide and piperonyl cyclohexane are among the least toxic of the insecticide constituents. Added to pyrethrum they increase its effectiveness against house flies, roaches, and many other insects. These combinations are safe and are recommended for use in the household and in food processing plants.

Allethrin, a synthetic pyrethrin, and pyrethrum, one of the earliest of the insecticides, both have a good record in use, though preparation of solutions of pyrethrum in kerosene have caused many a case of dermatitis.

Maximum acceptable concentrations have not been assigned to these materials. For comparison of relative toxicities, the acute oral LD_{50} for rats in terms of milligrams per kilogram of rat weight are given below:

Compound	Acute oral toxicity mg/kg (rats)
Piperonyl butoxide	11,500
Piperonyl cyclohexane	5,200
Allethrin	680
Malathion (90% Tech.) (For comparison)	480
Strobane	200
Pyrethrin	200

Inorganic Insecticides

THE INORGANIC compounds most widely used by PCO's for killing insects are the arsenicals and the fluorides, the former being about five times more toxic to man than the latter. Cases of poisoning have occurred from both of these groups of compounds, mostly through accidental ingestion. The fact that one part per million of fluoride can be included safely in water supplies should not be taken as an indication that insecticidal quantities should be carelessly used.

The American Conference of Governmental Industrial Hygienists have suggested the following threshold limit values for the amount of these compounds in air breathed over the work day:

Compound	Milligrams per cubic meter of air
Arsenic trioxide (as arsenic)	0.5
Calcium arsenate	0.3
Fluorides (applicable to sodium fluoride and to sodium silicofluoride)	2.5

Rodenticides

SOME six rodenticides are in common use by PCO's. Of these red squill is the safest but, as is well known, other rodenticides must be used for consecutive baiting.

Phosphorus continues in use but somewhat intermittently. It is received by the PCO in paste form. In mixing the paste with the bait, the phosphorus paste is sometimes heated to make it less viscous and thus to permit easier mixing. Phosphorus vaporizes at room temperature and on even gentle heating some oxidation accompanies the more rapid acceleration of vaporization, as is evidenced by the incipient "smoking" of the phosphorus.

In phosphorus match making numbers of cases of poisoning causing necrosis of the bone, more especially of the jaw, occurred in the early years of the century. In the fireworks industry about thirty years ago, an operation came under our observation in which small disks of a phosphorus gum tragacanth mixture were being individually wrapped by a group of sixteen girls. This seemed an unnecessarily high number of persons exposed and arrangements were made for installation of a machine which would require only one operator and which could be provided with exhaust ventilation. Before this could be done, one of the girls developed the condition known as phossy jaw, which terminated fatally. More recently, tons of phosphorus have been produced in electric reduction furnaces both by TVA and by private concerns. Exposures have been appreciable but cases of phossy jaw or other poisoning attributable to phosphorus have been rare.

The question arises as to whether the operation of mixing warm phosphorus paste with bait introduces an actual hazard. Our thought on this matter is that, although exposures may be greater around phosphorus furnaces without much evidence of poisoning, it is the better part of discretion to be guided by the experience in the phosphorus match and fireworks industries. We would recommend that the phosphorus paste be kept as cool as effective mixing with the bait permits, that exhaust ventilation be provided at any warming operation, that this exhaust ventilation be so located as to reduce the exposure of the person doing the mixing as far as is possible, and that no person be unnecessarily exposed to the vapor or the material itself. Natural ventilation as provided by a stack in the ceiling should not be considered adequate. A fan, motor driven, should be installed to remove the phosphorus vapor without drawing it past the breathing zone of the operator. Certainly much care should be observed to avoid inadvertent carrying of any of the phosphorus mixture into the mouth from contamination on the hands. Hands should accordingly be washed after the mixing operation.

Thallium sulfate is received as a white crystalline powder and is mixed with solid foods or dissolved in water in the preparation of the bait. Thallium sulfate is exceedingly toxic, its acute toxicity being comparable to that of arsenic trioxide. Poisoning may occur in handling this material both by inhalation of the powder or by absorption through the skin. The high specific gravity of the powder reduces the probability of excessive amounts remaining in the air, but careless handling in such a manner that the powder may become disseminated in the breathing zone is to be rigorously avoided. Rubber gloves should be worn to prevent skin absorption. Not only can acute poisoning occur from a brief accidental exposure to a considerable amount, but chronic poisoning may develop, as in lead poisoning, where there is repeated moderately excessive exposure.

Precautions for handling sodium fluoacetate (1080) and ANTU (alphanaphthylthiourea) are much the same though ANTU is considerably safer. However, even the latter has an acute toxicity of twice that of strychnine or arsenic. There is no antidote for either compound, a fact with which all

PCO's are thoroughly familiar, but ANTU is insoluble in water and stomach lavage if done promptly may prevent serious results of accidental ingestion. Actually the safety record has been good and ANTU may be used in food handling establishments and in residences according to the 1955 Report of the Communical Disease Center of the U.S. Public Health Service.

Compound 1080 is not only extremely poisonous but also acts with great rapidity. This fluffy powder is naturally white and similar in appearance to flour, powdered sugar or baking powder, but it is now dyed by the addition of 0.5% nigrosine black.

Although 1080 is not volatile, it can enter the body through the respiratory tract as a dust. Accordingly, it is considered essential that a respirator be worn when handling this material. This respiratory protective device should be a Type A mechanical filter respirator approved by the U. S. Bureau of Mines for protection against toxic dusts. Such respirators are available from the leading respirator manufacturers and safety equipment venders. Both the respirator and the filters have the letters "BM" and the approval number of them and this should be checked on all respirators to be used during handling of 1080.

The containers of 1080 should be stored in a securely locked place at all times when not in use. The keys for the storage space should be in the possession of a reliable person responsible for its storage and all operations connected with its use. Inventories of 1080 and its preparations should be regularly recorded and checked. All equipment used for weighing, measuring and mixing, and all bottles, bait containers, or other devices used in the operation should be labeled poison. Equipment which has come in contact with 1080 should be washed prior to being stored under lock and key and should be used for no other purposes.

The anti-coagulants are among the newer of the rodenticides. The first of these was given the common name "warfarin." This agent causes profuse internal bleeding after several days ingestion. Unless the rat is injured, little or no blood is noticeable externally except for an occasional bloody discharge around the nose or in the urine.

Among a number of trade names applied to brands of this rodenticide containing 0.5% warfarin concentrate, the compound itself or its sodium salt, or other compounds with similar action, there can be mentioned Compound 42, WARF-42, Warficide, Pival, Ratafin, and Rax Powder. Finished baits containing 0.025% warfarin and a Warfaricide preparation are also available commercially.

The possibility of becoming poisoned by a single exposure to warfarin appears to be remote. This is also true where a PCO may be handling 0.5% warfarin concentrate powder over six or eight consecutive days. With reasonable precautions, it is unlikely that he would inhale or ingest an amount of an ounce a day of the 0.5% concentrate, which would be necessary for him to experience the same serious illness as resulted when such a dose (assuming a man of 165 pounds weight) was ingested for six consecutive days with suicidal intent. Treatment in this case was started after the sixth day and recovery was complete. The first symptoms were back pain and abdominal pain which occurred the day after the sixth daily dose. Vomiting and attacks of nose bleeding then occurred. If absorption of considerable amounts of warfarin over a period of time should result in such symptoms or appearance of brownish spots on the skin (petechial hemorrhages), medical attention should immediately be obtained and the physician should be informed of the exposure to this anticoagulant having much the same action as Dicumarole. Vitamin K is effective as an antidote.

Fumigants

THE principal fumigants used at the present time by PCO's are hydrocyanic acid gas, applied in a number of forms, and methyl bromide.

Hydrogen cyanide acts through prevention of utilization of the oxygen carried by the blood and is very rapid in its lethal effect. If an insufficient amount of cyanide is absorbed to cause death, there need be no apprehension of chronic effects ordinarily as the cyanides are rapidly decomposed within the body. Hydrogen cyanide may be absorbed not only through the respiratory system but also through the skin. The maximum acceptable concentration as suggested by the American Conference of Governmental Industrial Hygienists for prolonged exposure is 10 parts per million. For a period of half an hour to an hour, 50 ppm may be tolerated without effect.

The materials used at the present time for cyanide fumigation include hydrogen cyanide as such, either in liquid form in cylinders under pressure or absorbed in wood or paper pulp disks packed in sealed cans. Another form is the solid calcium cyanide which resembles powdered slate or may be granulated and which slowly liberates its hydrogen cyanide on contact with moisture in the air or in the soil. Sodium cyanide is a white solid material provided in the form of eggs each weighing one ounce. Hydrogen cyanide is liberated when sodium cyanide is in contact with acid, sulphuric acid solution usually being used for this purpose.

A cyanogen chloride-hydrocyanic acid gas mixture may be prepared by adding hydrochloric (muriatic) acid to brickettes of various sizes made up of a mixture of sodium cyanide and sodium chlorate with inert material. The advantage of this cyanide preparation is that the liberated gases cause sufficient eye irritation to serve as a warning in the presence of dangerous concentrations.

None of these materials should be liberated at the place of business of the PCO. Storage of the cylinders and other containers should be in an area which can be readily ventilated in case of a leak in the container. Calcium cyanide and sodium cyanide containers should be stored in a dry area to avoid corrosion. If a portion of the sodium cyanide eggs in a drum or other large container are to be placed in a smaller container for transportation to the location to be fumigated, the cover should be replaced immediately. No acid should be handled or stored in the immediately vicinity of this drum.

Methyl bromide, like essentially all fumigants, is a fairly toxic compound, 20 parts per million being the maximum acceptable where repeated seven or eight hours exposures can be anticipated. On acute near-fatal poisoning there is primary injury to the lungs with pulmonary edema or severe bronchitis. There may be a latent period of two to forty-eight hours before the edema develops, followed by headache, dizziness, nausea, vomiting, muscular weakness, and collapse. It is believed that no permanent injury follows an acute non-fatal poisoning. Methyl bromide will produce severe blistering of the skin where either its vapor or the liquid is confined to the skin.

Methyl bromide is received by the PCO either in cylinders or one pound cans, in both cases as a liquid under pressure. Methyl bromide cylinders and the containers of the cans should be stored in a well

ventilated area. Care should be taken that the cylinders are so stored that they do not fall over and damage the cylinder valves, a precaution to be observed also with the cyanide cylinders.

General Precautionary Measures

IN THE handling of pesticides and in formulating pesticide preparations at the headquarters of the PCO, the best suggestion is that common sense measures based on a knowledge of the hazard involved be followed.

Operations should be reviewed from the point of view of the adequacy of precautionary measures now in force. Assistance may be obtained through such sources as the casualty insurance company's safety engineer or the city or state industrial hygiene division.

Even such ordinary operations as dumping a container into a mixer or scooping material from a drum may be done in such a manner that one operator only slightly exposes himself whereas another operator doing the same job but in a different manner may be grossly over-exposed. Although the PCO is not aware of the exact parts per million or milligrams per cubic meter of the material in the air at any given operation under all circumstances, a basic rule is that exposure of pesticides should be kept as low as is practically possible.

In the handling of dry materials or of volatile solvents, the control measures which are available include (a) segregation, (b) enclosure, (c) general and local ventilation, (d) wet methods, and (e) personal protection such as special clothing and respiratory protective devices.

The question occurs as to where and when should such control measures be utilized. The most satisfactory answer is to be gained through analysis of the air or of excretions of the exposed persons depending on the type of exposure. Where such services may not be available, a few general principles should be observed.

First of these is that where there may be evidence of irritation or other symptoms such as headache or tendency toward nausea, additional control measures should be instituted. Even though such symptoms are not too disturbing, they should not be overlooked since they may be indications of more serious injury which may show up after continued overexposure.

Typical examples of operations often requiring control measures are bottling operations where materials involved are volatile and where the air being displaced during the bottling operation escapes into the breathing zone of the operator. Another operation is that of repackaging dry materials which may be a severe producer of dust.

A second category of situations where control measures should usually be utilized is that in which the more toxic materials, referring to the pesticide itself, the solvent or diluent, are being used. Examples would be Compound 1080, carbon tetrachloride, and benzene.

After determining whether control measures should be used, the next decision is the optimum method of control. As a general observation, local exhaust ventilation is usually preferable to general exhaust ventilation as less air is required and better removal of material without exposure of the operator is usually obtained. However, where a mixer is located in a comparatively small room and general ventilation can be provided at small cost merely by the installation of a window ventilator of adequate capacity, this method might be entirely satisfactory.

If it is decided that respiratory protection is the optimum method of control, then the proper type of respirator or gas mask should be provided. It has already been mentioned that for toxic dusts, a Bureau of Mines approved filter type respirator is the choice. It may be added here that wherever respirators are provided as a means of protection, there should be supervision to see to it that these are cleaned at the end of each day that they are worn, that they are kept in a box away from the areas where toxic material may be present, and that each operator has his own personal respirator. If the respirator is to protect the operator against a solvent vapor such as xylene, then a cartridge type respirator should be used. One type of respirator is known as a fume respirator, and it should be understood that the term "fume" refers to finely divided particulate matter against which such a respirator is effective. Such a respirator provides no protection against vapors or gases. Where there may be eye irritation, then a cartridge type respirator with goggles included may be the choice; or where there may be any appreciable concentration of the vapor or where the exposure must be over a continued period of time, a canister type gas mask may be preferred.

Facilities should be provided for washing and for removal of clothing in the event it should become wetted with some pesticide preparation which may be absorbable through the skin.

After determining what controls in the way of procedure and equipment should be used, it should be made certain that everyone concerned knows about these and follows them. This is especially important with new operators who are brought onto the job.

Application of Pesticides by Service Men

HEALTH hazards of service men applying insecticides and rodent baits do not appear to be considerable. Reference is made here to operations where the materials placed in the hands of the service men are the bait ready for application and the insecticide in its final dilution as a solution or emulsion.

As a measure of the over-all hazards of this occupation, the compensation insurance rate for the classification can be compared with that of some other classification which also involves driving in city traffic and working around an assortment of premises and structures with which the service man may not be familiar. The classification of "radio receiving set installation and repair including drivers and their helpers" involves these operations, but with a traumatic injury hazard from antenna installation on roofs not present in the classification of "exterminators, including termite control, not including use of poisonous gas, including drivers and helpers," though including no appreciable occupational health hazard.

In many states, the compensation rate for the PCO classification is only slightly higher than that of the radio service classification and in Michigan it is slightly lower. As a measure of the relative hazards of termite extermination work, it may be noted that the rate in California, where it is understood that the greater portion of the work is in this operation, the compensation rate is more than twice that of the radio service classification.

The first hazard to be considered in the day of the pest control service man is that of driving to his locations with one gallon, screw top, galvanized cans of insecticide solution in his car. These cans should be examined each time they are used as the solutions of chlorinated hydrocarbon insecticides tend to cause some corrosion of the galvanized metal. If a can should start to leak inside a closed car, its vapor could readily produce sufficient drowsiness to cause the service man to lose control of his car. It should be considered of especial importance to have a car window partly open whenever cans of these materials are being transported. This hazard would of course be decreased by placing the cans in the rear storage compartment. However, from a practical viewpoint, where a service man has a tight schedule and several calls in one area, it would be much easier to return the can to the car rather than going to the bother of opening the luggage compartment. With the present low-odor solvents, the service man may not detect by sense of smell that solvent vapor is present in the car. Consequently, if he should be aware of undue drowsiness, he should check these cans to make sure none of them are leaking.

There appears to have been no difficulty so far from the one or two gallon pressurizing cans used to throw a fine stream of insecticide solution. These are made of heavier gauge steel than the galvanized cans and corrosive action is slower. Pressure is often applied by the filling station hose used for pumping tires. If one of these should rupture, serious injury would be expected. It is accordingly believed desirable to make arrangements for a hydrostatic test of these pressure units at 50% more than the working pressure at periodic intervals.

Insecticide Application

IN THE application of chlorinated hydrocarbon solutions and emulsions by directing a solid stream under pressure against the line of junction of wood and plaster, the pest control service man tends to be exposed more to solvent vapor than to the insecticide. But when an atomizer is used, the operator is exposed to both the chlorinated hydrocarbon and the solvent vapor. The severity of this exposure varies widely with the individual situation. Certainly when there is irritation of eyes or nose, an effort should be made to avoid the exposure sufficiently to eliminate the irritation. If the type of dispersing equipment or the degree of confinement of the area being treated is such that this is not feasible, then personal protective devices should be used.

When the irritation is primarily to the eyes, rubber-frame goggles may be worn. It is to be recognized that these are tiring to the eyes and at intervals the operator should leave the area where the irritating mist exists and remove the goggles for a brief period.

When the irritation is primarily to the nose and upper respiratory tract, a respirator may be worn. A cartridge type will protect against vapor. Replacement cartridges should be readily available and the new cartridge inserted as soon as an odor becomes apparent. If such replacements are required too frequently for convenience, then a canister type will be found to have much longer life. Where there is both eye and respiratory irritation, a full face piece mask is the preferred unit.

No studies of actual exposure to chlorinated hydrocarbon insecticides under normal operating conditions have so far been published. It is probable that the amounts of these materials absorbed by PCO's are not greatly excessive or injury to health among this group would have come to light by this time. Beyond the matter of alleviating irritation, the question of whether respiratory protection is necessary cannot be specifically answered without the knowledge of just how much of these materials is in the air breathed by the PCO under a variety of operating conditions and locations.

Rodenticide Application

THE possibilities of poisoning of the service man in placing rodent bait appears to be remote when reasonable care is used, such as washing the hands before eating. It is of course desirable for the PCO to preserve good relations with his wife to avoid a repetition of a case recently reported where a woman had added rat poison to her husband's lunch box sandwiches. Fortunately he detected an unusual smell and taste in the sandwiches and was unharmed.

Fumigant Application

THE principal hazard to the service man is the application of fumigants. Fatal cases are on record from handling both cyanide compounds and methyl bromide.

GENERAL PRECAUTIONS FOR CYANIDE: In handling cyanide in any of its forms, the detailed procedures and precautions available from the suppliers should be meticulously followed. This is true also of official regulations. A number of precautionary measures may be emphasized.

Gas masks equipped with canisters approved by the U. S. Bureau of Mines for protection against hydrogen cyanide should be available at all times. Equipment should also include an antidote kit of one carton of amyl nitrite pearls, two ampoules each of sodium nitrite (0.3 g. in 10 ml.) and of sodium thiosulfate (12.5 g. in 50 ml.), a serile syringe of 10 ml. and one of 50 ml. capacity. The location of the nearest telephone should be known in case of an emergency.

A cardinal principle is that no fumigator should work alone.

At the conclusion of the fumigation period, operators should wear gas masks approved for HCN when ventilating the premises. This is the most dangerous period in the fumigation operation.

Clothing which is wet should not be worn when re-entering the building to ventilate, or whenever in contact with hydrocyanic acid gas, as moisture tends to increase absorption of the gas into the clothing and then through the intact skin. If clothing becomes wet from perspiration or any other cause while in the presence of the gas, it should be removed immediately and dried in a well-ventilated place.

PRECAUTIONS FOR SPECIAL FORMS OF CYANIDE: Attention is directed to a number of precautionary measures for the protection of the PCO. Again it is to be urged that manufacturers' manuals be studied for complete details.

Cylinders of liquid HCN should be kept in an upright position and stored in a cool, well-ventilated place, shaded from the sun. In extremely warm weather, they should be submerged in water or kept in refrigerated storerooms. Do not remove the cylinder valve assembly from cylinder head. If it is impossible to open the valve as described by the suppliers, communicate with them for further instructions. Approved gas masks should always be worn when handling HCN cylinders. The operator should wear rubber gloves when connecting or disconnecting lines and operating cylinder valves.

Where only part of the contents of the HCN

cylinder is used at one time, the air pressure applied to discharge the contents should be released each time as soon as the required amount of gas has been discharged from the cylinder. The air pressure should be released through the vent hose which may be obtained from the supplier of the HCN. The end of the vent hose, which is 15 or 20 feet long, should be led to an isolated spot outdoors.

The cylinders must be returned to the point of origin within 90 days from the date of shipment whether the contents have been used or not. It is understood that stabilization of liquid HCN to prevent polymerization and decomposition, with possible resultant exposion, can be effected with certainty over a long period. However, to insure that the material is used within a reasonable time and to permit a periodic inspection of cylinders, the 90-day period is specified. This 90-day period includes what is considered an adequate factor of safety.

When liquid HCN absorbed in pulp disks is to be used in hot weather, and particularly when a fairly large quantity of disks are to be used at one time, they should be pre-cooled before the can in which they are packed are opened. This can be done by placing the cans in cold water, or by using dry ice.

In distributing the HCN-saturated disks, the unopened can should be placed where the disks are to be used. The operator with an assistant, both wearing approved gas masks and rubber gloves, should then start on the top floor, opening and emptying the cans of disks farthest from the exit. A number of alternative procedures for opening the cans are suggested by the supplier. The operator should keep the bottom opening of respirator cannister away from the top of the can of disks he is opening. Operators should never retrace their steps while scattering the disks even though equipped with approved gas masks. After finishing the top floor they should repeat the operation on the next floor below, but should complete the cellar before doing the street floor, which should be fumigated last. It is to be noted that, where some other fumigant which is heavier than air is to be used, a different procedure is necessary. Though HCN gas is slightly lighter than air, its density is so close to that of air that it will tend to follow the normal air currents within a structure.

Even though the operator is wearing a gas mask, he should not stand around in an area where the HCN disks have just been distributed or where calcium cyanide has been spread on the floor. Under the circumstances, the cyanide gas rising from the floor level can saturate the clothing and penetrate the skin to a dangerous degree. In one such case, collapse occurred though not with fatal termination. The operator had remained in such an area over-long and, on his going outside the building and removing his gas mask, the combination of skin absorption and inhalation of HCN diffusing from the clothing resulted in the excessive absorption.

In the use of granular calcium cyanide in a greenhouse where a considerable amount was applied in the operation commonly known as "burning out," the greenhouse owner elected to do the job himself rather than to call in a PCO. Failing to observe the precautions outlined in the manual, he was found dead close to the exit door.

Sodium cyanide is not used as extensively now as it was before more convenient forms were available. In addition to the foregoing precautions which are applicable, these measures should be observed.

Rubber gloves and goggles should be worn as protection when handling sulfuric acid. Rubber or dry cotton gloves should be worn when handling sodium cyanide and hands should be washed after each handling.

Where crocks are placed within a building for the generation of the HCN, the routes the men are to follow should be marked on the floor, wherever possible, in colored chalk—a color for each man. The sequence for placing the bags of cyanide "eggs" in the crocks should be as outlined for distributing the HCN-saturated disks, starting on the top floor. Operators should always wear approved gas masks and rubber gloves when placing a charge of sodium cyanide into the generator. Operators should never retrace their steps on any job to place a bag of sodium cyanide into a sulfuric acid container which may have been overlooked, even though the operators are protected with gas masks.

After the premises have been ventilated, the fumigator, with his approved gas mask strapped to him, but not wearing it, should go through the building to make sure that none of the bags of sodium cyanide "eggs" were overlooked and left lying beside the generators. Any unused charges should be immediately removed from the building. All crocks or barrels should be examined to see whether all the sodium cyanide has been decomposed. If a part of the charge appears to be left in a crock or barrel, or if the fumigator is in doubt about it, he should put on his approved gas mask before approaching or moving such crocks or barrels. Every precaution should be taken to avoid inhaling gases given off by the residues. If a generating unit bubbles when it is disturbed, it should be left alone until the bubbling has stopped. Only when the fumigator is certain that all generating units are inactive should men be sent into the building to remove them for dumping.

The residues left in generators, barrels, and crocks are corrosive and poisonous. They should be handled carefully to avoid spilling. When residues are being dumped, operators should have approved gas masks available and should wear goggles or face shields and rubber gloves. The residue will normally contain an excess of sulfuric acid. If by mistake an excess of sodium cyanide eggs has been placed in a container of the sulfuric acid, hydrogen cyanide gas will be evolved on dumping this container into the residue from other containers. Asphyxiation can result, and actually has occurred, from such an operation even though it is conducted out of doors.

In using briquettes made up of sodium cyanide and sodium chlorate with inert material, the precautions presented for use of sodium cyanide with sulfuric acid should be followed. The hydrochloric acid to which these briquettes are added is not as corrosive as the sulfuric acid solution but care should be taken to avoid contact with the skin and eyes. Personal protective equipment should be worn when handling this acid and briquettes.

It is to be noted that the "Safti-Fume" briquette produces a gas mixture of approximately 65% cyanogen chloride and 35% hydrocyanic acid. Cyanogen chloride is twice as heavy as air and hydrogen cyanide is slightly lighter than air. The manufacturer states that the simultaneous evolution of the two gases causes the tear gas effect of the cyanogen chloride to be present from the start of the generation until the completion of the ventilation operation. In this product, the cyanogen chloride is included not simply as a tear gas but for its insecticidal properties as well.

Warning agents such as chloropicrin (CCl_3NO_2) have been suggested for addition to hydrocyanic acid gas. This gas is nearly six times heavier than air. With a boiling point higher than water, it is readily seen that it is far less volatile than hydrogen cyanide. Thus, it is considered that use of chloropicrin provides a false sense of security and should not be added as a warning gas to hydrogen cyanide. However, a use of chloropicrin which has proven effective in ship fumigation with HCN has been its distribution in disks as a pre-warning gas to drive out stowaways prior to the fumigation with HCN.

METHYL BROMIDE: A number of fatal and non-fatal cases of poisoning have occurred to fumigators using methyl bromide. However, it is concluded in a publication of the U. S. Public Health Service (N. I. H. Bull. No. 185) that "in view of the tremendous quantities of methyl bromide used in past years for fumigation purposes, the number of accidents for such use is small indeed, indicating that methyl bromide may be used safely if certain precautions are observed."

Again noting that complete directions for proper and safe handling of methyl bromide as provided by the producers should be meticulously followed, a number of points are presented here.

As methyl bromide gas is three and a quarter times heavier than air, any basement area should be fumigated first rather than after the upper floors as is the case with hydrogen cyanide gas.

In opening one pound cans, the special equipment available from the supplier should always be used. In opening the valve of a cylinder, be sure that the cylinder is secure so that the back pressure from the escaping methyl bromide will not cause it to fall over. Such an accident can cause the methyl bromide to come in contact with the operator in considerable quantity. If such an accident should occur, clothes contaminated with methyl bromide should be removed as quickly as possible. The portions of the body in contact with the methyl bromide should be well washed. The clothing should not be worn again until all traces of methyl bromide have evaporated from it. This applies to shoes, which readily absorb the methyl bromide and keep it in contact with the feet, with resultant severe blistering. Splashes of liquid methyl bromide coming in contact with the uncovered skin will quickly evaporate and cause no appreciable effects.

Bandages, gloves, or other coverings on the hands should be avoided lest they absorb vapor or prevent rapid evaporation of the liquid. Gloves may thus increase contact rather than offer protection.

The gas mask to be worn when handling methyl bromide should be approved by the U. S. Bureau of Mines and should have a full face piece and the proper canister for Type B organic vapors. Canisters should be renewed frequently as recommended by the supplier. Methyl bromide is dangerous in concentrations which may be below those necessary to be detectable by odor. Consequently, the wearer of the canister gas mask should not depend upon the sense of smell to indicate when the canister has been used up and is no longer providing protection. If a sensation of dizziness, nausea, or headache should occur, the PCO should leave the exposed area at once and should be checked by a physician before returning to such an area. These symptoms may not be sufficient to cause the exposed person appreciable discomfort but all workers should have the facts impressed upon them that these symptoms, however slight, may be an indication of injury which may develop to serious proportions if excessive exposure continues and medical attention is not obtained.

Oxygen should be given as a first aid measure only by trained personnel who would be able to detect any signs of lung injury, in which case oxygen should not be administered. When oxygen is used, it should be 100% rather than a mixture with carbon dioxide and should preferably be inhaled against a positive pressure of not more than 6 cm. (2⅜ inches) of water. The recommended duration of oxygen inhalation is for 30 minutes in each hour for six hours.

In conclusion, the essential element in practical precautionary measures for successful handling of pest control operational hazards is the use of common-sense procedures based on a knowledge of the materials being used. This common-sense approach does not permit eliminating certain well-considered precautionary measures because these may have been omitted inadvertently a number of times with no injurious consequences; nor does it mean that a method of operation is to be based on assumptions where specific information is available.

It does mean that every PCO should recognize that materials are being handled which may cause injury within his own premises, to his service men as they carry on their work in the structures of his customers, and to the occupants of those structures. The PCO must not only be alert to these hazards, he must also see to it that his service men are well informed and that they follow proper procedures, and further, that the occupants themselves shall be adequately protected even though at times it may seem that this must be done against their will! It means that the PCO will be in contact with trained industrial hygiene personnel for review of the manner in which he conducts his operations. It means that the PCO will have established a relationship with a physician in the area of the operation and that this physician is informed of the materials which are being used.

In the event of an emergency, a life may hang in the balance of the prior preparation of a physician to give the proper treatment for the agent causing the distress.

Re-education

THE success of the treatment program for alcoholics is dependent upon the re-education of the entire industrial group. Everyone must be taught the newer conception of alcoholism. They must be made to realize that the alcoholic is a sick patient, not a degenerate weak-willed and hopeless wreck. He needs first of all, sympathy, tolerance and understanding, not criticism and intolerance. Also, it is extremely important that the disease be recognized as early as possible. Chronic alcoholism that has progressed to the stage of mental deterioration is extremely difficult to manage.

—From "Alcoholism In Industry," by GEORGE H. GEHRMANN, M.D., in *Plantation Health*, 21:2 (April), 1956.

Management and Scope of Treatment in the Surgical Department of a Large Industry

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IN ORDER to handle adequately any accident or illness which might occur while at work, the surgical department of a large industry should be organized in a manner that will allow an injured employee to obtain the attention of a physician at any time.

There should be an emergency hospital or clinic, centrally located or easily accessible from all parts of the plant. This unit should be staffed by a doctor and a nurse during all working hours in the large industries. In the smaller ones a full-time industrial nurse alone is satisfactory, provided a doctor is quickly obtainable. The company surgeon and his assistant must have adequate training and or experience in traumatic surgery, and one of them must be available at all times.

The number of nurses and doctors, other than the surgeon and his alternate, will depend upon the patient load. Additional doctors may be employed on a 40-hour a week basis, or part time on an hourly basis. The important thing is to have some doctor immediately available.

The emergency hospital should be equipped with an x-ray unit adequate for pre-employment chest and skeletal surveys and posttraumatic diagnostic studies. The type and amount of sundry equipment will depend on the types and number of patients treated. In a large industry we find the following additional specific items of value:

1. Several cots for temporary use.
2. Several "All Purpose" industrial chairs for hand and arm dressings.
3. "Universal" hand splints.
4. A physiotherapy department, staffed with a trained therapist.
5. Apparatus suitable for both resuscitation and the administration of oxygen.

Transportation to the emergency hospital must be worked out according to the area of the plant. For small areas there is no problem. For large industries with extensive areas it is expedient to designate "pick-up stations" from which patients can be collected at regular intervals by a small bus or station wagon. In the contingency a physician is required at the scene of an accident, a vehicle should be kept in readiness for his use.

Should a patient's condition necessitate hospital admission, an ambulance must be available to transport him to the hospital where the company surgeon is a staff member. We find it satisfactory to use an outside ambulance service for this.

Lacerations are given definitive treatment in the emergency hospital. Local anesthesia is used, debridement is carried out when necessary, and splints are applied as indicated. In the main, silk is used throughout. In our hands we find it safe to use buried silk or cotton when the wound has been adequately debrided and cleansed.

Puncture wounds are washed, cleaned, and dressed with vaseline gauze. Prophylactic antibiotics are rarely used. Tetanus toxoid boosters are given to men who have been in the armed forces or who state they have been immunized. Tetanus antitoxin is used according to the judgment of the surgeon who takes into account the type of wound, the instrument of trauma, and the surroundings at the time of injury. An intracutaneous test dose is given prior to administration. If the skin test is positive and T. A. T. is definitely indicated the patient is transferred to the community hospital for multiple desensitizing doses.

Minor burns are treated in the emergency hospital. The burned areas are cleaned, debrided if indicated, and dressed with compression bandages, using sterile fine-mesh vaseline gauze over the burned area. With certain exceptions, a burn is classified as a minor one if it constitutes no more than 10% of the body surface. The exceptions are: burns deep enough to damage important structures, and those involving the perineum, groin, or face. Major burns are hospitalized.

Finger amputations are treated as outpatients. Where amputation is complete, enough bone is debrided to create a flap which is closed with silk. Should there be an evulsion of skin an attempt is made to replace it; if this is not feasible, a small full-thickness or thick-split thickness graft from the forearm is sometimes applied immediately. We have not used distal full-thickness grafts in lieu of flap creation.

From a paper read at a Joint Meeting of the Chicago Surgical Society and the Chicago Society of Industrial Medicine and Surgery.

Severed tendons on the dorsum of the hand or foot are usually repaired without hospital admission. Splints are applied and the patient returns for follow-up care. Volar tendons and all nerves are repaired under general anesthesia after hospital admission.

When possible, fractures and dislocations are treated in the emergency hospital. This includes open fractures unless extensive. When oxygen is available, sodium pentothal can be used for reduction of dislocated elbows or shoulders, and lesser fractures such as of the wrist. Major fractures are admitted, and closed reduction is always given first consideration. If open reduction is required we use as little radio-opaque internal fixation as possible.

We have found it best to hospitalize, and operate at company expense, all employees with herniae originating or questionably originating at work. This seems to promote better industrial relations, lessen legal fees, and decrease the number of recurrences, which in turn minimizes loss of time by the employee.

Collapse due to overheating and salt depletion is continually guarded against. During the recent past there have been fewer such cases than were prevalent many years ago. We ascribe this to better eating habits and a higher standard of living among the workers. Because salt tablets may cause gastric discomfort, there may be provided various types of salt and salt combined with glucose tablets, as well as candy containing salt. Employees working in hot environments are cooperative in taking one or more of these supplements. Men with muscular or abdominal cramps are given intravenous physiological saline. Those who collapse and are pale and cool are termed "heat exhaustion," and are given intravenous glucose and saline. Those in either of these categories are relieved quickly with this treatment. A more serious condition however is "heat stroke." By this we mean general collapse with a high temperature and a flushed skin (heat retention). These cases are usually not given intravenous fluids until the temperature is reduced to 101°F for fear for pulmonary edema. Active measures are taken to reduce the fever. Cold sheets, ice bags and fans are used in an attempt to accomplish this.

Rehabilitation is aided by regularly prescribed physical treatment. Whether available in the plant or provided for by outside contract, a good physical therapist is invaluable to administer massage, induced heat, whirlpool and electric muscle stimulation, and, more important, to teach exercises and active motion. Whenever possible, patients are kept at work in order to prevent deterioration of function, coordination, muscle power, and morale.

All patients with skull fractures or suspected intracranial injuries are hospitalized and observed. Should any question arise as to possible surgical intervention, a qualified neurosurgeon is called in as consultant. If neurosurgery is advisable, he is asked to handle the case. This is done in spite of the fact that it may necessitate transferring the patient to another hospital. Injuries involving loss or destruction of teeth are all referred to a local dentist, and complicated face injuries are sent to a maxillofacial surgeon.

We do not prescribe any certain type or make of prosthesis for major amputations. When ready, the patient is supplied with a list of reputable prosthesis makers, and his name is submitted to these concerns, who in turn contact him and demonstrate their products. The choice is then left to the man who must wear the prosthesis. It is agreed that no artificial member compares favorably with the original, and there will always be complaints. We feel, however, that there are fewer dissatisfied patients if each man is allowed to choose for himself.

To prevent trauma to eyes, workers are provided with protective goggles. Eye injuries are all seen originally in the emergency room. Floating foreign bodies can be removed by irrigation or by a cotton swab. Should an adherent particle be removable with a simple cotton applicator, this may also be done. No eye spud is used over the pupillary area. Superficial lacerations of the lids are sutured, but consultation is requested whenever there may have been associated blunt trauma to the eyeball itself.

Patients with adherent foreign bodies over the pupillary area, ulcers, inflammations, deep foreign bodies, possible blunt trauma such as detached retina, and lacerations of the sclera or tarsal plate of the lid are all immediately transported to a competent ophthalmologist, who continues to treat the eye until it is recovered or no more can be done.

Skin eruptions are particularly bothersome to the average surgeon. We do not feel competent accurately to diagnose any of them. Every patient, therefore, who presents himself with a dermatological problem is sent directly to a dermatologist, who sends us a report as to whether in his opinion the condition is industrial in origin. If so, he continues to treat it at company expense; if not, the patient is advised to see his family physician or any dermatologist of his choice.

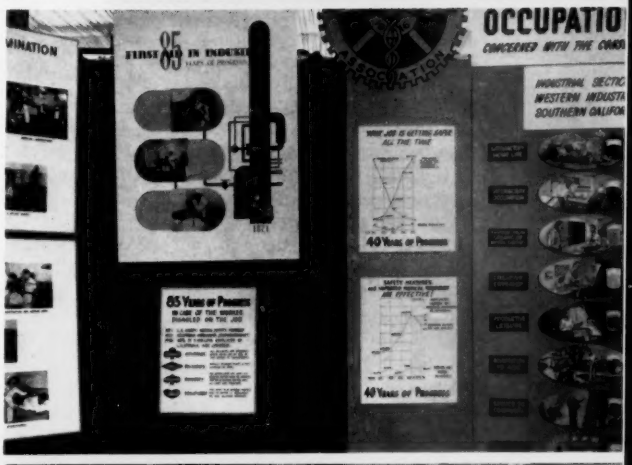
We endeavor to treat each employee as if he were our private patient. At the conclusion of treatment and rehabilitation we try to estimate fairly and impartially the degree of permanent disability. We do not make this figure for purposes of future bargaining.

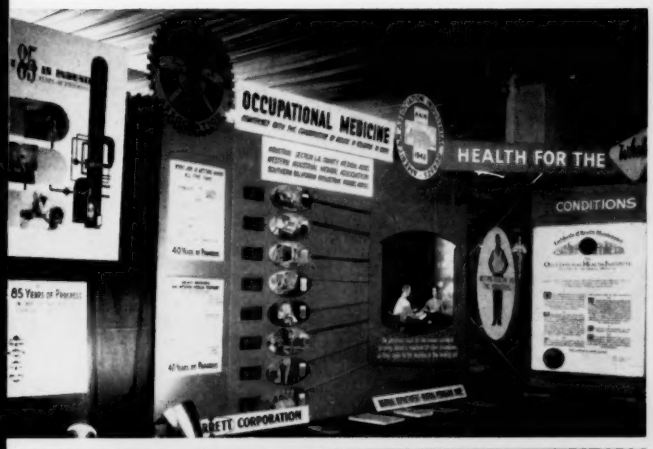
A general plan has been outlined for the management of the surgical department in a large manufacturing plant. There will necessarily be variations in details should this plan be applied to the different industries. These variations will depend on the geographic location, number of employees, and type of hazards peculiar to the industry, as well as the professional abilities of the surgical staff. The plan outlined has proved satisfactory to us.

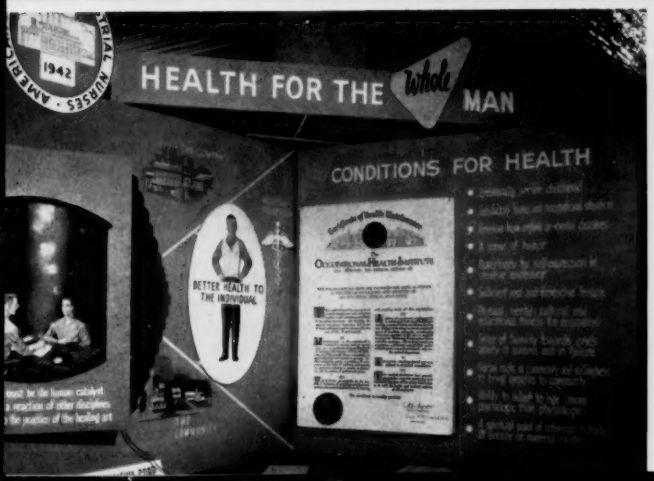
(208 South LaSalle Street.)

Cavalcade of Medicine

THE CAVALCADE OF HEALTH and Medical Progress held at the Shrine Auditorium and Exposition Hall in Los Angeles, January 6-15, 1956, as part of the 85th Anniversary of the Los Angeles County Medical Association, was attended by more than a quarter of a million lay people. The whole field of medicine and surgery was represented in exhibits designed to show the tremendous progress that has taken place in medicine, and what it is accomplishing in the promotion and improvement of health. The industrial medical program was put on by representatives from the Western Industrial Medical Association and the Industrial Section of the Los Angeles County Medical Association. In a three-day scientific program, which preceded the Cavalcade and was given primarily for the medical profession, industrial medicine was represented by James H. Sterner, M.D. The industrial medical exhibit included posters, placards, charts and various displays, together with a blown-up picture of the Occupational Health Institute Certificate of Health Maintenance, evidencing approval of Industrial Medical Programs. This exhibit won a "First Place Award." The Committee in charge of the exhibit included: H. S. ELMQUIST, M.D., Chairman; EDWARD J. ZAIK, M.D.; JEROME W. SHILLING, M.D.; CLARENCE L. LLOYD, M.D.; A. C. REMINGTON, M.D.; WILLARD I. NESSON, M.D.; PACKARD THURBER, JR., M.D.; and FRED BRYAN, M.D.







Medical Aspects of Automation

—INFLUENCE ON INDUSTRIAL MEDICAL PROGRAMS

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AUTOMATION is more than just a word to describe new techniques for mechanically accomplishing work in our plants and offices. It has been defined in many ways and degrees, from the elimination of human direction and hand operations on the assembly line to the automatic control or operation of machines by other machines. Automation is not just a further advancement of mechanization. In mechanization man and machine function together, one as an extension of the other, in a sense. In automation man supervises the machine but is not involved in its actual operation.

But much more than the method of production is involved. Automation signifies a whole new way of life, with bio-social values as well as technological ones. It will change the living and working habits of people, alter educational patterns in our schools, and raise our standard of living to new heights. This paper is concerned with the effects of these developments on human beings.

The state of health of an individual is determined by a complex combination of factors involved in his adjustment to his total environment. When that environment faces alteration it is human nature to feel uneasy. Individuals cannot help wondering, "How is this going to affect me?" Mental attitudes are resistant to change. The advent of the Industrial Revolution was met at first with fear and bitterness. Violent attempts were made to halt its progress. The first multiple spindle machine was destroyed in 1768 by spinners who feared the loss of their livelihood. The invention of the steam engine also raised misgivings in many quarters, and dire predictions were made of the unemployment it would create. But the machine age opened opportunities far beyond the wildest dreams of those who worked to bring it about. Prosperity lies in productivity, and there is no reason why automation should not further increase both.

Industry's Stake in Health Maintenance

NEVERTHELESS, the anxiety of employees in these early days of the era of automation is one of the human relations problems which will arise, and these are closely allied to the health and well-being of the worker. Other aspects of automation will bear more directly on the physiological status of the worker, but it is the sum total of all problems, both physical and emotional, which determines the total health picture of an individual.

Anticipation of these problems is as essential to advance planning for automation by industries as are the engineering blueprints and the management studies to determine the economic feasibility of such a move. A company's employees have always been its most valuable assets, and automation is not going to change this. In fact, more responsibility will be vested in employees than heretofore. There will be a larger number of technical jobs, including maintenance and repair of the complex machinery and monitoring of automatic equipment. This will call for greater skills and more training and education. Management personnel will be called upon to make major decisions. Errors in judgment would be costly.

In addition, each employee will represent a much larger capital investment than heretofore. In 1954 the capital investment per worker in the chemical industry, which is highly automatized, was twice that of industry as a whole, or $26,000; and in some plants it is considerably more.[1] The present investment per employee in the electric power generation industry, which is almost completely automatized, is in excess of $106,000.[2]

Thus, automatized industry will have an even higher stake in maintaining the health of its workers. Illness not only disrupts production while workers are absent but also results in a loss of efficiency during the periods when the worker is on the job but is not feeling well.

It is estimated that absenteeism costs industry more than $5 billion in terms of services and lost production. If all intangible factors were considered, this figure would prove to be considerably more, and still would not take into consideration the economic loss incurred by employees whose efficiency is at a low ebb.

From these considerations, and humanitarian ones as well, it is important that industry look ahead to anticipate some of the problems that are likely to arise. Despite the fact that many authorities predict a relatively gradual transition to automation, an increasing number of companies are following the trend. Manufacturers of automatic controls have estimated that automatized equipment has been installed in 100,000

Presented April 4, 1956, at the Industrial Relations-Production Conference on "Impact of Automation" sponsored by the Industrial Relations and Production Committees of the Industrial Department of the Chamber of Commerce of Greater Philadelphia.

manufacturing plants in the United States during the past few years.[3] Of course, for a long time to come there will be many companies, small ones in particular, which will find it economically unsound to switch to automation. Industries which are seasonal in nature would find it too costly to automatize since one of the economic principles involved is the need to make continuous use of the equipment. A study by the Research Institute of America indicates that 17.6% of the 100 companies replying to a questionnaire use automation now and another 17.1% anticipated its introduction within the next 10 years.[4]

Preventive Medicine Is Best Approach

REGARDLESS of the method of manufacturing, there is one approach to health maintenance which is good management policy, and that is preventive medicine.

Preventive medicine is concerned with the total physical and mental well-being of the worker, both on the job and at home. It is a specialized form of medical and public health practice, combined with the newer principles of hygiene, sanitation, engineering, toxicology, and health promotion. Modern methods of environmental control have greatly reduced the possibility of occupational disease and injury. One of the Industrial Hygiene Foundation's member companies has reported a reduction in on-the-job injuries of 63% in the past five years, and this is not an exceptional case. Automation will further eliminate occupational hazards, but this does not mean that working people will be on the job every day. Non-occupational injuries and diseases account for 90% of absenteeism.

Industry, by doing its part to keep the worker healthy around the clock, is not taking on an unnecessary burden, but is protecting its own interests. Even the most comprehensive medical program will be less costly than the losses incurred through worker absenteeism, including higher operating costs because of substitution of perhaps untrained personnel, spoiled products, higher disability wages, increased group hospital and surgical insurance payments, and many intangible losses.

Such a program in no way infringes on the general practice of medicine. Industry and its physicians have the opportunity to discover physical conditions which might have gone unnoticed and untreated, and such cases are referred to the worker's physician. Also, through health counseling and education, the worker can learn to take better care of his health and to avoid injury.

That such a program is well worth-while is pointed out by the experience of Du Pont in which off-the-job injuries were reduced 20% from 1953 to 1954, and on-the-job experience was reduced 40%. Data collected showed that "in the first six months of 1955, 82,000 employees in the laboratories and plants suffered 786 injuries off the job, and only 30 on the job."[5]

This would not imply that safety is lacking in the working environment. The majority of accidents are the result of human failure, relating directly to the victim's physical and mental well-being. It has been estimated that only a third of workshop accidents can be regarded as caused by machines, and only a third of these, or 10% of the total, are due to lack of mechanical protection. This would indicate that the source of nine-tenths of the accidents are to be found in man's constitution and behavior when confronting the machine.[6] Thus, protecting the over-all health of the employee serves the double purpose of keeping him on the job and making him also a safer, more efficient worker.

Let us take the ideal industrial health program as many leading companies have it today and see how it fits the requirements of the automatized industry, what adaptations will have to be made, and how they can be accomplished. At present we have only limited experience on which to base an evaluation of the medical needs connected with continuous processing methods of manufacturing. Whereas the engineers can scientifically determine how to convert to such a process, and management can employ reliable statistics to calculate the desirability of such a move, the medical profession is faced with many intangible elements which will play a part in the health aspects of such a program. Today's industrial physician needs to have a broad understanding of not only physiology, but psychiatry, sociology, anthropology, human engineering, and industrial hygiene, as well.

First, let us consider the employee in relation to his working environment. In the ideal plant, atmospheric contaminants are well controlled. Industrial hygienists keep a constant check at all operations where industrial dusts or toxic fumes or gases are a threat. The harmful properties of all raw materials used in the manufacturing process have been determined through biologic tests. The industrial physician is also well acquainted with the specific hazards encountered in his company, and with the physiological effects of exposures. Engineers have employed control measures in the design of the machinery and in ventilation and air-conditioning systems. The same attention is given to ridding the work environment of radiant heat and of noise. Where hazards cannot be completely eliminated, protective clothing and equipment are standard requirements for each worker.

Better Environment Through Automation

AUTOMATION will provide the solution to many such environmental health problems. Workers will no longer be exposed to air contaminants, since manufacturing operations will be enclosed. In many cases workers are stationed at control panels which are completely isolated from the actual processing area. Such factors as ventilation, temperature, humidity, and noise no longer affect his performance. In fact, control criteria in fully automated factories are such that the standards of air cleanliness with respect to dust for successful operation of the equipment are far more critical than those for humans. Automation eliminates much of the actual contact between

worker and material, making possible the use of compounds of ingredients formerly too toxic to handle safely.

In the rubber industry raw materials proceed from bins through scales and into the mixer without manual handling. It is hoped to devise automatic machinery to reduce all mixed stocks into pellet, or flowable, condition so that they can be conveyed to bins over automatic mills for feeding extruders or calenders.[7]

In one plant manufacturing large metal containers which required manual soldering of side and end seams, resulting in an exposure to lead and solvents, automatic equipment was installed which permitted better ventilation and completely eliminated exposure to the toxic materials. Not only was the worker's health protected, but also a superior product was achieved.[8]

The oil industries introduced automatic controls into their refineries some 30 years ago as a safety measure to handle operations in danger areas. Today both the oil and the chemical industries utilize automation to a high degree, both to protect the worker and to expedite production.

While automation will relieve the day-to-day chronic exposures to toxic materials, there still exists the danger of catastrophic exposures due to ruptures in the lines or of acute exposures where maintenance work is involved. Workers accidentally and drastically exposed to toxic materials will require special and prompt treatment, and the industrial physician must have, ready and available, knowledge based on studies of the toxic properties of the materials used in manufacturing.

Nor will automation eliminate the need for investigating toxic properties of new products before introducing them on the market, or, better yet, in the development stages. The consumer's health and welfare must be protected. Where harmful properties cannot be eliminated, codes must be set up for the safe handling and use of the product by the public. With increased productivity made possible by automatic processing, manufacturers will need to develop new products so that costly equipment will not stand idle.

A Boon to Physical Safety

AUTOMATION will also materially lighten the safety department's task where prevention of physical injury is concerned. It will release men from dangerous jobs, and consequently will eliminate most of the traumatic injuries. Even safety devices on machinery can be inadequate because they do not account for human failure to utilize them. With true automation the worker seldom if ever comes in contact with the machinery; there is no chance of catching fingers or hands in moving parts. Manual handling of heavy stock in the loading and unloading of machines and in the transfer of stock within the plant is also eliminated, so that there is no danger of physical strain or injuries such as crushed feet. The Ford Motor Company's experience indicates an 85.5% reduction in the number of hernias at operations where automatic equipment has been installed.[9]

Automation, while not eliminating the need for decisions by human beings, replaces some of man's sensory apparatus in connection with the operating function of the machine and thus relieves the chance of error in human perception, which is too often affected by such factors as mental stress and physical fatigue. Man no longer needs to pace himself to the rhythm of the machine—a rhythm which may be an unnatural one and result in tension and possible accidents. He does not even need to strain to catch faulty production. For example, in the textile industry's weaving operation, safety devices on automatic looms disconnect the machine at the least accident. These and other similar automatic controllers in other industries protect both the operator and the plant.

Modern production has already reached a stage where many operations are beyond man's ability to handle, either because of physical factors or health hazards inherent in the process or material used. If the demands of a constantly rising standard of living are to be met, we must continue to increase productivity. Automation is the answer to that need. It has been predicted that the population in 1975 will be 220 million but that there will not be a proportionate increase in the active labor force because of changing statistics in age groups. There are some 65 million persons in the labor force today—people 14 years of age and over—who are willing and able to work. To hold the same ratio of 41%, the labor force would have to have 90 million workers in 1976 even to maintain the present standard of living, whereas it is expected to fall far short of that number, perhaps by as much as 10 or 12 million.[10] Perhaps automation will prove to be the saving grace that makes it possible for man to enjoy more leisure rather than a monster that tramples men and the pursuit of their economic needs underfoot. Certainly it will not be possible to satisfy the increasing wants of a constantly growing population without the aid of technological advances. One cannot imagine modern refineries or chemical plants or many of the steel industry's operations carried on at their present-day levels without automatic safety controls. It is simply impossible for man to carry on such huge and dangerous projects unaided.

New Responsibilities of the Medical Department

WE HAVE mentioned some of the ways in which automation will make the plant environment a healthier and safer place to work. What effect will it have on the functions of the Medical Department? How can industrial health specialists anticipate the health problems that may be caused by automation in industry?

Certainly even less staff time will be required for the treatment of injuries and for traumatic surgery, in view of the reduction in safety hazards. But the modern concept of industrial health —prevention rather than cure—will be more important than ever. Industrial psychiatry, health counseling, selective placement through evaluation of the applicant's physical and mental con-

dition—all these become important responsibilities of the industrial medical program.

The Preplacement Physical Examination

THE KEYSTONE of a good health maintenance program in industry is the physical examination, beginning with the preplacement examination, followed up by periodic and special studies. The value of a preplacement examination has been mentioned earlier. Not only does it uncover physical defects which often can be corrected if caught in time, but also it assures that an employee will be placed on a job commensurate with his physical and mental ability. It is important that the personnel department comply with the recommendations of the medical staff. Healthy individuals, properly placed, are more productive and safer employees. Where employee and job are ill matched, the work will not be a source of satisfaction and will create tension and stress in the employee. The preplacement examination is also important for record purposes as well in establishing the degree of injury or disease present at the time of employment, since 42 states have "second injury" laws or funds which make the employer liable only for the newly acquired damage and not for the total disability.

Anatomical or physiological requirements for work in automated industries can be revised. Certainly physical strength will play a lesser role in the production scheme, making possible the employment of many handicapped or aging workers. It is important that this group be provided for in our economic structure. Merely supplying funds, too often inadequate, for their sustenance is not enough. The increasing number of the aged population, particularly, is growing into a major economic and social problem.

The Periodic Examination Pinpoints New Problems

IT IS THE relationship of work to the stress disorders which will most concern industrial physicians henceforth. Industry has recently begun to pay more attention to the inroads that stress can have on health. Up to now industrial physicians have looked for the greatest symptoms of stress disorders among the executives. Heart trouble, high blood pressure, and ulcers are typical of the organic problems found most commonly among the executive group. With automation the number of skilled and professional workers will greatly increase. The periodic physical examination in these early days of increasing automation can provide industrial physicians with valuable information as to the degree of occupational stress automation is having on its workers. This type of examination is an excellent tool for keeping abreast of changing industrial health problems and makes possible the further extension of preventive medicine.

The worker will be relieved of the dirty, backbreaking jobs, the unpleasant working conditions; he will be taken away from the repetitive, monotonous, highly specialized tasks such as those found on the assembly line. He must, on the other hand, be prepared to fill the requirement for upgrading to semi-technical jobs, such as maintenance and repair of the machinery, engineering, machine design, and supervisory posts. The challenge may prove a strain, although for many employees retraining will solve the problem.

Most large companies conduct training programs as a regular practice and no doubt will continue to absorb shifts in employment through this channel. The industrial physician must carefully weigh the stresses of the job against the capacity of the individual. Periodic examination is the best means for keeping the two in balance and avoiding a breakdown in the worker's health.

More Psychosomatic Disorders a Possibility

WHETHER automation will increase the number of psychosomatic disorders remains to be seen. It has been estimated that 20% of all employees in peacetime are borderline emotional cases, unable to bear efficiently the stresses of industrial work.[11] At least half of the people who visit the industrial Medical Department are not actually ill but are reacting to a combination of physical, mental, and emotional factors. New responsibility on the job, poor supervision, factory fatigue, poor job placement, adverse working conditions, insecurity, personal anxieties, home and family problems—all exert stress and strain on the worker and show up in his mental and physical health picture.

Certainly a good industrial medical program can do much to reduce psychosomatic illnesses by recognizing and controlling occupational factors and by counseling the employee on both occupation and personal problems which affect his health. One company which is giving serious attention to nervous disorders which rob a worker of operating efficiency on the job is the Socony Mobil Oil Company. Dr. G. M. Saunders, head of the Medical Department, and also Chairman of the American Petroleum Institute's Medical Advisory Committee, says that much can be done to lessen the effects of illness. The key to the program, he says, is the periodic examination and counseling by a physician, confidential and usually non-compulsory.[12]

The industrial physician can often get to the roots of an employee's health problem by talking with him. Where emotional stress is a factor, merely discussing the situation may relieve the stress. Pent-up emotions and psychic tension can lead to very real physical disorders, such as stomach ulcers and high blood pressure. Dr. Christopher Leggo has said that probably no one is of such stout emotional material that he could escape becoming acutely emotionally disturbed by a combination of trials or misfortunes. He defines the state in which any of us can find ourselves when we are confronted with greater stress than we are temporarily able to handle as a "situational neurosis." Since the industrial physician has at his command the knowledge of an individual's past work history and past behavior patterns, Dr. Leggo says, he is in an excellent position to recognize the symptoms as psychosomatic and to help the employee over the rough spot.[13]

Health Counseling and Education

BY MAKING available to employees health educational advice and materials on such subjects as home safety, nutrition, and sanitation, industry serves to cut down on non-occupational illnesses and injuries. With the shorter workday or workweek likely as automation increases, people will have more leisure time. How an individual spends this off-the-job time can affect his health picture. Such interest in the welfare of the individual need not be paternalistic, and when handled properly in the Medical Department can be an instrument for good industrial relations. Good morale can be most effective in preventing frustrations and maladjustments that can lead to illnesses of a psychosomatic nature.

This new emphasis on preventive and constructive medicine calls for increased attention by our medical schools to the health problems facing industry. Not nearly enough attention is being devoted to preparing physicians, and particularly those planning to go into industrial medical work, to administer health maintenance programs.

Human Engineering

AUTOMATION will require that all physicians—those in private practice as well as those in industry—know much more about the tolerance of the human organism to the stresses of occupation. The man-machine relationship must be studied carefully by both the physician and the design engineer in order to achieve the most efficient and beneficial use of human capacities and skills. Despite the fact that man will be required less and less to work jointly with a machine in the production of goods, the need for attention to the stress-strain problems of man at work, in planning the work facilities and the working environment is not eliminated. Instrument dials and other control panel components at which the employee in the automatized industry will work must be designed with the physiological capacities of the man in mind. Boredom and fatigue can be caused by improper eye coordination, and this is only one of the factors involved.

Summary

AUTOMATION is not going to have the effect of an atomic bomb falling on us. On the contrary, it will mean greater enjoyment of life, and will make possible a greater humanization of industry. The working environment will undoubtedly be a safer, healthier place, and many of the hazards will be completely eliminated. Any new medical problems which arise can be coped with by adhering to the principles of preventive medicine, utilizing the knowledge and techniques of industrial health specialists in all the professional fields.

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A Page from History

UNDOUBTEDLY some critics of American Industry will argue that management was acting in self-interest because some states had started to enact workmen's compensation laws. Others may contend that management and owners realized that good health within a company is financially rewarding. Undoubtedly both factors had some influence. Let me quote, however, from the minutes of the Du Pont Company's Executive Committee for October 18, 1915. Mr. Irenee du Pont, then Chairman of the Committee and now Honorary Chairman of the Board of Directors, made the following recommendation: "It is suggested that it would be well to have the principal employees of the company examined by competent doctors, with the object of discovering organic troubles or disease, where such may exist, in order that remedy may be applied thereto before the trouble made itself apparent without such precautionary examination. . . . It would seem inadvisable to make such examinations compulsory as that might seem objectionable to a small percentage of the men. Probably if examinations were offered without charge to the employees the great majority would avail themselves of the opportunity, for it would confer a benefit on the men themselves."

—From "Challenge for Industrial Medicine," by EMILE F. DU PONT, Director, Employee Relations, E. I. du Pont de Nemours & Company, at the Annual Meeting of the AMERICAN ACADEMY OF OCCUPATIONAL MEDICINE, Cincinnati, February 16, 1956.

Award to Management

Pennsylvania Railroad Cited for Health Achievement Program

THE AWARD for Health Achievement in Industry is an *Award to Management.*

It is given each year by the Industrial Medical Association to the industry the management of which, in the opinion of the Committee appointed by the IMA, has made recent outstanding and significant progress in the inauguration and maintenance of a medical program for its employees. The Committee this year selected the Pennsylvania Railroad Company as that industry.

The Award was presented to James W. Oram, the Railroad's Vice-President, Personnel, at the Association's Annual Banquet at the Benjamin Franklin Hotel, Wednesday evening, April 25, 1956.

THIS NEW PROGRAM had its inception in the minds of management some time prior to 1952. In September of that year, Dr. Norbert J. Roberts was engaged to make a study of the existing plans and procedures, with a view toward their amplification and extension through the creation of a Medical Department which would be separate from any other department of the Railroad. In a critical examination of operations the management had seen fit to include a reappraisal of the Railroad's medical policy and facilities. Dr. Roberts spent a year on this, and found much that was good, yet gaps existed that new techniques and concepts would fill. Forthwith the management called for new planning, and Dr. Roberts developed the program which went into effect in September, 1953, with Dr. Roberts as Medical Director. It is believed that this is the first time the Chief Medical Officer of a railroad was ever given that title.

From the beginning Dr. Roberts had the full support and cooperation of Mr. Walter S. Franklin, then President of the Railroad, and Mr. James Newell, Operating Vice-President.

Clockwise: A. M. W. Hursh, M.D., Assistant Medical Director; A. G. Cerchione, M.D., Regional Medical Officer, Lake Region; N. J. Fine, M.D., Regional Medical Officer, Southwestern Region; W. M. Woodward, M.D., Regional Medical Officer, Pittsburgh Region; Robert S. Ayerle, M.D., Regional Medical Officer, New York Region; Donald L. Glenn, M.D., Medical Director; David W. Bishop, M.D., Works Medical Officer, Altoona; W. J. Gerstle, M.D., Regional Medical Officer, Northern Region; G. A. Vance, M.D., Regional Medical Officer, Northwestern Region; John H. Bechtel, M.D., Regional Medical Officer, Buckeye Region; John M. Brewster, M.D., Regional Medical Officer, Philadelphia Region.

Medical Secretary Barbara Stratten greets patients in the cheerful reception room at the PRR's new Philadelphia Medical Center. One hundred employes now visit the clinic daily.

In September, 1955, Dr. Roberts resigned to become Associate Medical Director of Standard Oil Company of New Jersey, in New York, and Dr. Donald L. Glenn, present Medical Director, was appointed to succeed him.

THE PENNSYLVANIA RAILROAD serves 13 states and the District of Columbia, with just over 10,000 miles of route covered by 24,283 miles of track.

Currently, the Railroad has 110,000 employees, of whom 26,874 are engine or train service people subject to annual physical examinations if over the age of 40 and to biennial examinations if under 40.

The medical staff includes 67 full-time physicians, more than 400 part-time company surgeons, and 41 registered nurses.

Officers of the Company, of whom there are more than 750, are urged to take annual physical examinations under the Medical Department's program of preventive medicine.

THE PRR HEALTH maintenance program was well-described in *The Pennsy* (April, 1956), the Company magazine, as follows:

"Industrial medicine has come a long way since that day in 1886 when Dr. Samuel W. Latta arrived at the old PRR Relief Department offices in Trenton with a satchel full of medicine and became the Pennsylvania Railroad's first chief medical examiner. How great this advance has been was shown at Philadelphia when the Railroad opened its new Medical Center, staffed by doctors and nurses, technicians, and clerks, and designed specifically to protect and promote the health of PRR employees.

"The new Medical Center has air-conditioned offices, examination and treatment rooms on the fourth floor of 30th Street Station, Philadelphia, and from its ultramodern x-ray department to its waiting room design it is a complete industrial clinic.

"Doctors at the Medical Center have at their disposal modern machines, devices, and facilities for use in diagnostic work. There are two rooms just for electrocardiograms, which record a patient's heartbeat in a check for heart disease. A chest x-ray machine discloses signs of tuberculosis or other lung disease. The fluoroscopes show evidence of gastro-intestinal, kidney, or other internal disorders. The laboratory is fully equipped for the making of blood counts, blood chemistries, and similar tests. Eyes are checked on Ortho-rater machines, and hearing is tested in a soundproof room.

"These and other facilities are all available to the staff doctors who make the routine preplacement examinations of new employees, the periodic physical checks of personnel involved with train movements, and the 'return to work' examinations required after any employee has been out sick more than six days. The

Examination begins as Dr. W. F. Matteucci, one of 10 on staff, takes blood pressure.

Chest x-rays are taken of most diagnostic patients. Dr. Joseph McKee views a film.

Largest item at the Medical Center is this fluoroscope and x-ray unit for internal examinations. Technician Edith Ricketts assists as Dr. Joseph McKee prepares patient.

Medical Center's services also are available to any other PRR employees who may desire a medical check-up. 'We welcome any employee in the area who suspects he has something wrong to make an appointment for an examination,' says Dr. John M. Brewster, Philadelphia Region Medical Officer, who is in charge of the Medical Center. 'The employee will be told of our findings and, if he or she desires it, we will give our information to the family doctor with a recommendation for treatment. Of course, all our findings in diagnostic cases are confidential between the doctor and the patient.'

"Other employees, Dr. Brewster adds, may be directed to the Clinic by their own doctors for diagnostic check-ups. The PRR Medical Center will make these examinations, without charge, and the findings will be turned over to the employee's family doctor. 'I want to make it clear, however,' Dr. Brewster adds, 'that it is not our policy to give treatment in any of these cases. We want to work with family doctors, but not in competition with them. It will be up to each employee to go to his own doctor with our findings and arrange for treatment.'

"The one exception to the treatment policy is in cases of on-the-job accidents and injuries. The Medical Center has a complete dispensary for the treatment of injuries, and a small operating room where the staff surgeon can do minor operations. In addition, there is a complete physiotherapy department where injured employees receive rehabilitation treatments before returning to work."

In soundproof cubical, Technician Barbara Davidson tests hearing with audiometer.

Blood counts are made by Technician Bea Zastavny on microscope in the laboratory.

THE MEDICAL CENTER at the 30th Street Philadelphia Station serves 20,000 and is the first of five—the others being scheduled for New York, Chicago, Altoona, and Pittsburgh.

Included in the over-all medical plan is a new industrial hygiene program under a full-time Industrial Hygiene Director, reporting to and working with the Medical Department.

The medical staff at this Center includes: Donald L. Glenn, M.D., Medical Director; A. M. W. Hursh, M.D., Assistant Medical Director; James F. Morgan, Director of the Industrial Hygiene Section; John M. Brewster, M.D., Regional Medical Officer, Philadelphia; and James D. Thornton, M.D., Medical Officer in Charge, Medical Center, Philadelphia. The Medical Director reports to the Vice-President, Personnel.

The following are: the Medical Policy of the Pennsylvania Railroad; and a Guide for Management in the Administration of the Medical Policy. These were established February 15, 1953:

Medical Policy

MINDFUL of the fact that good health is an incalculable asset, the Pennsylvania Railroad desires to assist employees in its maintenance. It is intended that the Company's role supplement rather than replace that of employees' personal physicians.

Efforts to achieve this goal are to be made in the

Nurse Ann Atkins tests employee's vision on an Orthorater and records the results.

Rehabilitation treatments are given on exercise machines in physiotherapy room.

fields of Preventive, Constructive, and Curative Medicine.

PREVENTIVE MEDICINE: Applicants for employment will be examined to determine their medical fitness for the duties to be assigned them, weighing justly any defect or disease which might constitute a hazard to themselves or to others. Working environments will be supervised medically in an attempt to prevent exposure to any hazards to health.

CONSTRUCTIVE MEDICINE: Employees will be examined periodically, the frequency of such examinations varying with age, health, and work performed. In this manner a contribution will be made to the maintenance of their health. The early detection of a deviation from normal often permits its successful treatment. Such periodic examinations will be required for all employees upon whose health the safety of others is dependent and for those exposed to occupational hazards. The examinations will be offered to other employees desiring them. Employees with non-occupational illnesses or injuries will be assisted when desired by referral, with records of their examinations, to outside physicians of their choice for treatment. Medical counsel in health maintenance will be available to employees, and health educational information will be brought to their attention as indicated. Examinations for membership in Company sickness and injury benefit plans will be made upon request, and certification of disability will be given by a physician when such plans and the evidence require this action. Employees returning to work following absence due to illness or injury will be examined to determine fitness to resume their duty. Employees applying for retirement because of disability will be examined upon request.

CURATIVE MEDICINE: Where practical, dispensaries will be established to care for employees involved in minor accidents, and to assist in the efficient transferral of others to outside Consultants and facilities if necessary. These dispensaries will also render minor medical services for non-disabling illnesses for which employees would not ordinarily visit their private physicians.

GENERAL: The physician's primary obligations will be to the health and safety of the employees. Information given by a patient in confidence in the course of professional consultation will remain confidential within professional channels unless the employee requests its release. For the benefit of all employees, however, Management shall be entitled to complete information regarding industrial accidents, occupational diseases, or illnesses resulting from or constituting public health hazards. Pertinent medical data will also be made available to Management in the event of claim negotiations or litigation concerning a specific injury or illness, but the extent of such disclosure shall be at the discretion of the Medical Director.

Guide for Management

IT IS THE function of the Medical Department to carry out the established medical policy competently and efficiently.

The physician in charge of the Medical Department is known as the Medical Director. He is directly responsible to the Vice-President—Personnel. One of his duties is to render reports at suitable intervals concerning the general activities of the Department.

Preventive Medicine

THE TREATMENT of disease is expensive, time-consuming, and often unsuccessful. Wherever possible it is the goal of modern medicine to prevent disease and thus obviate the need for treatment and loss of time.

A. CLINICAL MEASURES:

Certain clinical measures should be utilized to protect both individual employees and groups of employees from illness or injury.

1. *Preplacement Examinations:*

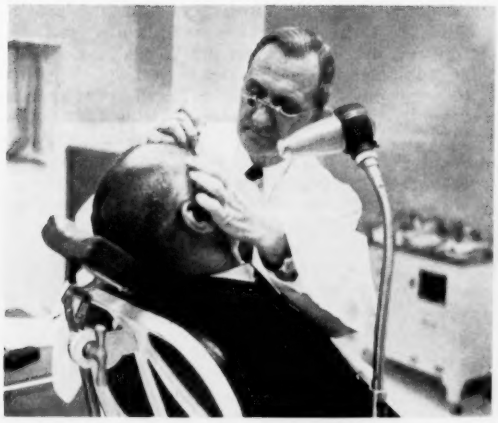
Medical examinations should be given to all applicants for employment before assignment to duty. Every worker should be physically and emotionally able to perform his duties in such a manner that he is not and does not become a hazard to himself or to others. The examining physician, bearing in mind any existing disability, should recommend work limitations where indicated.

2. *Examination of Food Handlers:*

Food handlers, who prepare or serve employees' food or food for the travelling public should be examined for communicable diseases at the time of employment, and at periodic intervals thereafter.

3. *Inoculation of Employees:*

In areas where certain diseases are endemic, periodic inoculations should be carried out against these diseases.



Dispensary patient with sore eye is examined by Dr. John Brewster, Clinic Chief.

Emergency case is treated in operating room by Dr. L. Matternes, Nurse D. Shun.

B. INDUSTRIAL HYGIENE MEASURES:

These measures are directed toward recognizing working conditions that may affect employee health adversely, and correcting them. The following outline describes briefly some of the techniques used.

1. *Industrial Hygiene Surveys:*

In order to locate, define, study and control health hazards, periodic surveys should be made by competent personnel. These surveys should be undertaken to determine whether workmen are exposed to toxic materials, the nature and extent of the exposures, and the adequacy of the methods in use to control the hazard. This information concerning the working environment should be, in turn, correlated with the medical data obtained from examinations of the exposed workers, and appropriate recommendations made.

2. *Special Studies:*

Whenever changes are made in methods of operation, or materials used, special studies should be made in order to evaluate and control any new hazards. A highly technical study of the working environment is often required. This may involve careful analysis of individual jobs, the exact measurement of the degree of contamination of the atmosphere or equipment so as to establish levels of exposure, review of employment records and other data as may be indicated in specific situations. Recorded chemical and toxicological data should be studied.

3. *Industrial Sanitation:*

Facilities for personal hygiene such as washing or bathing facilities, toilet installations, adequate locker space for storage of clothing, etc., are necessary. The Medical Department should advise, recommend, and approve installations so as to provide optimum protection of employees.

4. *Assistance in the Control of Hazards:*

The Medical Department should coordinate the general procedures and methods devised for controlling all hazards which affect the health of the employee. Such problems include: (a) exposures to poisonous fumes, dusts, gases, mists and smokes which may result in acute or chronic illness; (b) excessive noise; (c) improper illumination; (d) excessive heat, cold or humidity; (e) improper ventilation; (f) exposure to radioactive materials.

C. SANITARY MEASURES.

In the larger towns and cities sanitary control may be established by local regulations over which the Company Medical Department may have no jurisdiction. Nevertheless, it must be kept informed about the general sanitary measures in force and make necessary recommendations.

1. *Food and Food Sources:*

Recommendations should be made regarding the source, distribution, and handling of food supplies wherever this is necessary for the health and welfare of employees and the traveling public.

2. *Water:*

Recommendations should be made regarding the supply of a sufficient amount of safe, potable water for drinking, food preparations, and personal cleanliness. Dining cars and employee and travelling-public eating places should be inspected for cleanliness. Procedures for handling food and beverages should be studied. Ample methods and materials must be available for proper cleansing of drinking glasses, dishes, utensils, etc.

3. *Sewage and Garbage:*

Recommendations should be made on appropriate disposal of sewage from all sources, and of garbage, without creating a problem.

4. *Atmospheric Pollution:*

Recommendations should be made on the control of vapors, mists and dusts that would affect surrounding communities.

Constructive Medicine

CONSTRUCTIVE MEDICINE is the art of keeping an individual in the best of health by searching for signs and symptoms of incipient disease. It attempts to control or minimize certain forms of disease by understanding their mode of onset and forestalling their progress.

Vigorous attack upon factors causing or influencing the progress of disease is of vital importance. In order to carry out the program properly, the Medical Department should perform the following examinations and functions:

A. PERIODIC HEALTH INVENTORIES:

Examinations of this type should be done throughout the period of employment. They should be thorough but also flexible and individualized. The medical history should include not only the usual inquiries concerning personal and familial disease, but also the occupational, social and neuropsychiatric information necessary for the practice of Constructive Medicine. In addition to a thorough clinical examination,

the health inventory may include: (1) blood count; (2) urinalysis; (3) x-ray examination of chest; (4) serological tests; (5) any other laboratory procedure indicated as a result of the history or physical examination.

The frequency of the periodic examination varies, depending upon the age, health status, and duties of the employee. Such examinations will be compulsory for employees upon whose health their own and others' safety is dependent. They will be voluntary for all others. Many individuals, especially in the older age groups, will have chronic disease and require frequent consultations.

Occasionally consultations with specialists may be found necessary at the time of periodic inventories. Such consultations should be at Railroad expense if they are essential to the Company physician or are necessitated by the possibility of occupational disease or by a question of residual effects of industrial accidents. In order that these periodic health audits may be performed competently, the Company should provide the necessary personnel, space and equipment.

B. COMPLETE DIAGNOSTIC EXAMINATIONS:

If as a result of periodic examinations, or from information obtained in the dispensary, from the employee's personal physician, or from other sources, it becomes apparent that additional diagnostic studies are desirable, these may be done in the Company Medical Department whenever possible.

C. SPECIAL EXAMINATIONS FOR EMPLOYEES:

Employees who have been absent due to illness or injury should be examined to determine their fitness to resume their duties. Employees being assigned new duties should be examined to determine their fitness for them.

It is necessary in the prevention of occupational disease to examine regularly employees engaged in work which might result in exposure to potentially toxic substance. Insofar as possible, such examinations should be coordinated with the periodic health inventories. The physician who performs these examinations must be cognizant of the type of hazard that may be involved.

D. REASSIGNMENT OF DUTIES FOR MEDICAL REASONS:

Because of individual handicaps, susceptibilities, or diseases found at the time of the preplacement or periodic health examinations, it may be necessary to limit the type of work assigned to an individual. Recommendations of a general nature are made on the basis of the findings so that reassignments may be arranged when possible.

E. MEDICAL RETIREMENT (BECAUSE OF ILLNESS):

When it becomes apparent that ill health precludes a worker's continued employment, the Medical Department may recommend retirement.

F. MEDICAL COUNSEL AND EDUCATION IN HEALTH MAINTENANCE:

This phase of the medical program should offer medical guidance to the employee, medical training programs for medical personnel, and coordination of medical information within the Medical Department as well as with other departmental programs.

1. *Medical Guidance for the Employee:*

Proper medical information on the prevention of diseases and the correction of existing defects should be made available. Health education techniques should be used to impress the employee with the importance of early recognition of tuberculosis, cancer, etc. Similar methods should be used to teach the employee how to live and work within the limits of his capabilities whenever he is the victim of a disease or defect.

2. *Graduate Study for Medical Personnel:*

Carefully selected graduate study should be provided to promising members of the Medical Department whenever and wherever this is deemed advisable for the Medical Service.

G. COORDINATION OF MEDICAL KNOWLEDGE WITHIN THE COMPANY:

The Medical Department should cooperate and collaborate with other departments dealing with employee welfare, or with matters having medical aspects.

Curative Medicine

THIS PHASE of medical activity has to do with the treatment of disease and injuries. The Medical Department provides the following medical care and services:

A. MEDICAL CARE IN DISPENSARY:

The dispensary is designed for the treatment of minor disorders and emergency cases. These facilities should be located in close proximity to the working area whenever possible so as to avoid unnecessary delay in handling emergency problems, inconvenience, and loss of working time.

B. MEDICAL SERVICE IN EVENT OF CATASTROPHE:

A working plan for emergency Medical Service in the event of catastrophe such as a wreck, explosion, or fire should be carefully organized. Provisions should be made for suitable quarters and additional personnel necessary to cope with such emergencies. Emergency supplies of drugs and equipment should be kept available.

Relaxation

FOR MANY EXECUTIVES the problem of relaxation is less a matter of physical exertion than the art of switching mental energy from office problems to equally absorbing outside diversions. More and more business men are finding painting an outlet for nervous energy. Eight Manhattan executives play in their own dance band. Across the U.S. business men's pastimes range from astronomy to zither playing, but they serve their purpose only when they consistently keep the mind away from money-making. Business men are realizing also that relaxation cannot be limited to week ends and vacations, but must also extend to conscious conserving of energy on the job itself. Some executives get away from work during working hours by lunching alone, taking brief strolls, reading a chapter of a book.

—From "Executive's Choice—Slow Down or Blow Up." from *Time*, January 23, 1956, quoted in *The Management Review*, March, 1956.

Maintaining Emotional Health

MENNINGER FOUNDATION SEMINAR FOR INDUSTRIAL PHYSICIANS

THE FOLLOWING three papers were presented as part of the session on "Psychiatric Treatment" at the Menninger Foundation Seminar for Industrial Physicians. The Seminar, entitled "Maintaining Emotional Health," was held March 5-9 in Topeka, Kansas (*Indust. Med. & Surg.*, 25:4, 177 (April) 1956).

Psychiatric Treatment
Somatic Methods

PAUL E. FELDMAN, M.D.
Director of Research and Education
Topeka State Hospital

SOMATIC therapies have undergone some clear cut changes during the past 50 years. Prior to 1930, various types of sedation and hydrotherapy were the treatment of choice. Weir Mitchell's rest cure consisted of the isolation of the patient in a darkened room, removal of all noxious stimuli, nourishing diet, and complete bed rest. In Mitchell's hands this was a successful and popular form of therapy. Since 1930 the introduction of the convulsive agents caused a decrease in this method of treatment though it has not been completely abandoned. Electric shock and insulin coma therapy were the treatments of choice until the introduction of the ataractics four years ago. Though the transition from convulsive shock to ataractic therapy is still in process, reports consistently emphasize that the latter therapy has already supplanted convulsive therapy.

Dauerschlaff (prolonged sleep) was a popular form of therapy during the first three decades of this century. It was used primarily for the treatment of schizophrenic disorders, but favorable results were also reported in a number of psychiatric conditions. The technique involved primarily the administration of hypnotic doses of barbiturates (usually sodium amytol) and a sleeping state was maintained for weeks. The patients could be easily roused for feeding, cleansing, etc., but immediately lapsed back into sleep when stimulation was withdrawn. It apparently was a fairly successful form of therapy but had the shortcomings of requiring considerable nursing care, and, as one might suspect, there was a fairly high incidence of pulmonary complications.

More recently hibernation has been used with some success. It is patterned after dauerschlaff, and the state is created by the administration of a "cocktail" containing a number of drugs. This technique utilizes newer pharmacological preparations and has such added refinements as darkened room and lowering of body temperature. One is reminded of a combination of dauerschlaff and Mitchell's rest cure.

Milder degrees of sedation are still being used effectively in the treatment of mental illness. Various barbiturates in sub-hypnotic doses can be effective in controlling milder degrees of anxiety, hyperactivity, tension, insomnia, etc. It should be borne in mind that patients under the influence of mild sedation have a lowered threshold of consciousness, increased reflex time, diminution of intellection and learning function. As a result they are less alert or competent, cannot respond as well to an emergency, and may manifest behavior or ideation indicative of defective judgment. It is still a valuable form of treatment for minor mental disorders and as an adjunct to the treatment of more serious disorders. In properly predisposed individuals continuous medication with sedatives runs the possible risk of an habituation. Other than for this, shortly following discontinuation of medication there should be little if any toxic residual.

Hydrotherapy in the treatment of mental disease is one of our oldest known treatments. Its popularity appears to have been at its height just prior to World War II, though in many institutions where limited personnel preclude more advanced and modern treatments it is still popular. In some places it is being largely supplanted by other procedures. At Topeka State we have sections which do not utilize this form of therapy, at all.

All forms of hydrotherapy must be administered by a competent hydrotherapist. The usual type of treatment (packs) involves the total immobilization of the body exclusive of the head. This is accomplished by wrapping the patient in layers of sheets and blankets. Packs may be administered as wet or dry and at body or refrigerated temperatures. Individual treatments should be limited to two hours, and the pulse should be checked carefully and frequently to detect an impending cardiac collapse. This form of therapy is quite effective for the immediate management of an acutely disturbed patient, and usually has a definitely calming effect. There are few residuals following treatment other than for a moderate degree of malaise and lethargy.

Continuous tub-treatment also seems to be disappearing from the American scene. It is a form

of treatment in which the patient is placed in an over sized bath tub with the body supported by a sling or hammock and the torso restrained within the tub by a covering camisole. The body then becomes immersed in circulating water at body temperature or at some degree of tepidity. Frequent or prolonged immersion requires the protection of the skin from maceration—usually by olive oil or one of the silicone products. This form of therapy has indications similar to those for a pack and has the advantage that the patient may be maintained in it for indefinite periods. It is accompanied by no residuals other than weakness and malaise immediately following treatment.

Stimulating showers were popular during the 1920's but are used infrequently at this time. They consisted of the forceful application of water at varying temperatures to part or parts of the body. Examples are the "needle shower" and the "scotch douche." They were a useful form of therapy for the retarded or depressed patients and were not accompanied by any residuals.

About 1934, Meduna introduced the use of Metrazol in the treatment of mental illness. It consisted of the intravenous and rapid injection of 3-10 cc. of a 10% acqueous solution of Metrazol with the development of a grand mal convulsion in from 10 to 60 seconds following injection. The grand mal is almost invariably preceded by a terrifying aura which results in a reluctant and uncooperative patient after the first few treatments. The seizure is usually followed by a short sleep following which the patient may be confused, ataxic and excited for varying periods.

Metrazol therapy was used primarily for schizophrenic and manic-depressive patients though it has been tried in all forms of mental illness with equivocal results. It has been largely replaced by electro-convulsive treatment but is still utilized by some psychiatrists, especially if they feel that the patient has great need for punishment. Repeated treatments result in a residual "organic reaction" characterized by dulling of consciousness, memory defects, diminished intellection and judgment, and this syndrome clears gradually in three to four weeks following cessation of treatment.

Following Cerletti's demonstration that electric currents could produce convulsions in humans without permanent ill effect, the present ECT supplanted Metrazol as the method of choice for convulsive therapy. It consists in the application of 200-400 miliamps via flat electrodes to the bitemporal area for a fraction of a second. The grand mal reaction is instantaneous and is not preceded by an aura as was seen with Metrazol. Insufficient current usually results in a petit mal reaction which is undesirable. The post-convulsive sequence of events was quite similar to that with Metrazol with the unique difference that the ECT patient had a complete amnesia for the treatment. Organic reactions similar to those with Metrazol were seen and more frequently. Many patients are receiving this form of therapy on an ambulatory basis, though others feel that this should strictly be a hospital procedure.

Up to 10% morbidity has been reported with both Metrazol and ECT, but the skillful use of a Glisando will minimize this with the latter treatment. The usual complications are fractures of long bones, compression of vertebral discs, rupture of tendons and muscles. Deaths have been reported but are relatively rare. The question of restraint and support during treatment is usually handled on an individual basis. Some advocate extreme restraint and others just the opposite. Most men who utilize this form of treatment compromise between these two extremes advocating restraint when body excursions become too exaggerated.

Immediate residuals seem to clear in about 20 to 30 minutes. Those who utilize this form of treatment on an outpatient basis usually allow the patient to leave in about 15 to 30 minutes after they awaken. A course of treatment usually consists of 10 to 20 convulsions administered on alternate days. Some men advocate daily treatments and others advocate several treatments a day, depending upon the mental state of the patient. It appears to be a particularly effective treatment for depressions and involutional melancholia.

Sakel introduced the insulin coma treatments at about the same time that Meduna introduced Metrazol. The course of treatment consists in the production of 20 to 60 comas, by the injection of gradually increasing amounts of insulin. Comas are terminated by the administration of glucose, intravenously or by stomach tube. The time in maximum coma varies from 15 minutes to an hour, some advocating various lengths of coma. It is still, today, the treatment of choice for various types of schizophrenics, but is without question the most hazardous of our shock treatments. Complications vary from delayed coma to irreversible coma, pulmonary edema, spontaneous atelectasis, and cardiac collapse. Residuals are relatively few but organic reactions are sometimes seen. Immediately following termination of coma many of these patients pass through a period of lucidity which is extremely valuable for psychotherapeutic purposes.

Photoshock is a relatively new form of convulsive therapy which has not attained wide usage. The treatment consists of the production of grand or petit mal seizures by subjecting the patient to a flickering light, with or without premedication by some type of drug which lowers the convulsive threshold. This form of therapy is still too new to conclude as to whether it is a superior form of convulsive therapy. It is a useful diagnostic agent for convulsive disorders and will frequently evoke pathological electro-encephalographic waves if they are dormant. No residuals have been reported with this form of treatment, other than the usual post-tictal phenomena.

PHARMACOTHERAPY has received nation-wide attention during the past three to four years, but this form of therapy is as old as medicine itself. Shortly after the introduction of Metrazol therapy, a number of workers reported good results

in the treatment of a wide variety of mental disorders by the injection of up to eight to 10 mg. of histamine; a usual course of treatment consisting of 10 to 20 such injections on alternate days. Following the injection of histamine, there occurs profound flushing and hypotension which persists for 10 to 15 minutes. The value of this drug in the treatment of mental disorders is questionable and research is being continued.

Amphetamines have become popular in the treatment of mild depressions, and neurotic and asthenic states. Their value is also undetermined. Caution is advised because of the possibility of addiction and cardiac damage. Immediate residuals consist of increased alertness, increased tension, and a sense of well-being.

Nicotinic acid is now being widely used in a number of mental disorders, but success appears to be limited to the various geriatric states. It is occasionally administered in conjunction with oral Metrazol. Its advocates claim that it improves cerebral circulation and oxygenation. Statistics are suggestive that this form of therapy may be of benefit in the mental disorders associated with senile and arteriosclerotic changes in the brain. Improvements in memory, orientation, personal hygiene, and interest in the environment have been reported. There are no residuals; it appears to be non-toxic.

Mephanesin has been advocated for the treatment of various mental states for the past eight to 10 years. Most of the claims have been largely discounted. It may still be of some value for the relief of muscular tension provided adequate doses are used. There are no residuals.

The "tranquilizers" or ataractic drugs have appeared upon the psychiatric scene in the past four years. Their impact is already felt, and there are strong indications that they may replace many former types of therapy. The most widely used are Reserpine and Chlorpromazine. More recently, 'Pacatal,' 'Equanil,' 'Frenquel,' and 'Meratran' have been receiving our attention. If these drugs have any specificity it has yet to be determined. Most of them have the following characteristics in common: (1) their mode of operation and fate in the body is unknown; (2) fairly high incidence of toxic side effects; (3) need to individualize dosage; (4) manifest their effect primarily by diminishing tension, anxiety and hyperactivity. All of them are being tested on a wide variety of psychiatric disorders and at this early date it appears that they are most effective for states of increased psychomotor excitement and anxiety; relatively ineffective for depression (exception—Meratran); only moderately effective in eliminating or ameliorating hallucinations (exception—Frenquel).

Residuals are primarily those related to untoward side effects: (1) drowsiness, (2) jaundice, (3) parkinsonism, (4) water retention, (5) hypotensive responses, (6) gastro-intestinal disorders, (7) blood changes, (8) depression, (9) allergic manifestations, and (10) animal experimentation is suggestive of lowered threshold of consciousness and increased learning time.

Rehabilitation of the Emotionally Ill

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THE APPARENT mystery surrounding the nature of mental illness and the mental patient contributes to a feeling of rehabilitative nihilism where the emotionally ill are concerned. Considerable progress has been made in the past few years in the treatment of the mentally ill person in the hospital setting but little formalized thought has been given to rehabilitation principles after hospitalization.

Here are a few prevalent myths, among many, concerning the state hospital patient. He is first of all thought of as being somehow not quite human any longer. For having allowed himself the error of waiting too long before seeking psychiatric help or for not having enough money to pay for private care, he is thereafter designated a mental patient. He is whisked behind the hospital doors where the doctors perform their devious and obscure treatments. After a respectable lapse of time he reappears at the gates of the institution apparently having passed the trial by ordeal or having done the proper penance for the "sin" of becoming emotionally ill. These are not uncommon myths.

Mental illness is a disease manifested by a breakdown in the ability to maintain proper perspectives of oneself as well as of other people. Inherent in this simple formulation, but difficult to realize, is the emotional thread, more technically called affect. We can love to work, hate to work, love to make do-it-yourself projects, or have no interest in once enjoyed activities. There must be emotional investment of some kind, and it is the dysfunction of these affective responses which underlie much of the illness of the patient.

Treatment of the emotionally ill person has always been talked of in terms of procedures within the hospital setting or the psychiatrist's office. One hears such terms as shock therapy, insulin coma therapy, drug therapy, psychotherapy, music therapy, and, of course, psychoanalysis. Someone who was interested in enumerating types of therapy came up with 37 different kinds. Most of these have to do with the hospitalized patient, or certainly with one fairly closely supervised. When mental hospitals were simply custodial institutions there was no problem. Patients filled the rooms, the halls, eventually the attics and the cellars. Rehabilitation was a term not yet coined for hospitals because the idea of treatment was quite unheard of.

Treatment in the hospital of today has more to do with binding, arranging, distributing and reawakening the aforementioned affective responses of the emotionally ill. On nearly every chart in the mental hospitals of Topeka there is an order sheet, usually set aside for the prescrib-

ing of attitude. Every person connected with the patient is made aware of the affective needs of the patient. A sick lonely person may have prescribed "love unsolicited." A depressed person will have prescribed "kind firmness." A delusional angry patient may have "matter of factness, passive friendliness, avoid physical contact" prescribed.

These orders are not idly written. They are designed to enable the personnel to work with the affective needs of the patient. Activities are specifically prescribed. Old artistic talents, such as music, painting, wood working, to mention only a few, may be revived.

At first these may be done haphazardly by the patient. Later, depending upon his progress, he may be expected to improve on his performance. Praise is prescribed in one case, no praise in another, insistence on even better excellence in another. An activity may be prescribed to allow an outlet for agression in one patient. Another may need a sedating type of activity.

Work, closely associated with the play activities, is also as specific. For example, a patient used to arising at a certain hour, doing a regulated compulsive job, has been doing this because he feels most comfortable having this kind of job. In the hospital a similarly compulsive regimen will be prescribed. Why not renew the usually successful measures of meeting life's situations?

Socialization maneuvers are also prescribed. At first a timid patient may go only to movies. Later he may be encouraged to attend dances. He may become part of a group, part of a ward government. Group interactions are observed, evaluated and encouraged or discouraged.

All of the activities prescribed above come under the generic label of milieu therapy. There is the assumption that whatever happens to the patient throughout the 24-hour day can be made therapeutic. All his contacts, his activities, his rest, his food are arranged to benefit his reappraisal of himself.

With respect to going home, our patient of today is the victim of one more myth. He is thought of as not being quite wholesome any more and must be ignored watchfully to see that he doesn't contaminate the more respectable citizenry. Rehabilitation is difficult unless this last myth is vigorously attacked. The patient is between the urgings of the hospital behind him to go forth, and the hostile society on the outside telling him to stay where he is. It was a breakdown in his relations with his fellow man that caused him to be hospitalized but because he was hospitalized he has difficulty being reaccepted. The point to make here is that the term rehabilitation had better be replaced by the term continued treatment. Treatment of the patient should not stop when he stands at the exit gates but should follow him into the community, and the community must be helped in accepting this responsibility. It is well known that few patients are ever sent to a hospital because they are ill. Most come because they have disturbed or offended someone else.

THE FIRST area of resistance the patient meets when he is ready to leave the hospital has to do with his family. They are not to be blamed as such because it frequently happens they have suffered because of the patient's illness. A hypomanic patient may have run roughshod over his family before they decided he was sick and not just being mean. The wife who is physically or sexually abused by "previously paranoidally jealous husband has a right to question the decision of the staff to send him home.

Patients don't get sick in a vacuum, and members of the family are often emotionally brittle themselves. Old antagonisms, fancied injustices and family feuds become sources of guilt for the members of the family who send the patient in and they have difficulty facing him when he returns. Before he was hospitalized, his irrationalities left a mark on the family and they expect him to behave similarly when he returns. Some relatives refuse to take the hospital's word as to the patient's wellness.

Rehabilitative work for the patient then includes treatment for the family, assuming that his own symptoms of irrationality have been treated. The patient must watch how he eats, what he says, and how he does things, because he feels he is on trial. He may feel blue and wish to be alone for an hour, but no, "what will the little woman think?" He has lost status with his children who take his guilt to school. A rebellious teenager can make a shambles of the patient's emotional security.

The best handling of the home phase of the patient's treatment starts when the patient is first hospitalized. Frequent contact by the social service worker and occasional sessions by the ward doctor help retain the interest of the patient's relatives. It is not uncommon for a wife to seek outpatient treatment for some of her own problems after several sessions with the worker.

THE COMMUNITY is the next potential source of conflict for the patient. As mentioned before, most patients are hospitalized not because they are ill but because their symptoms may have become severe enough to bother someone. Where a law has been broken the complexion of the continued treatment changes. Many laws are so written that when a patient gets well he becomes responsible for his previous acts, despite the fact that these acts may have been symptoms of the emotional illness.

There are more frequent, less well defined problems in the patient-community interaction. There are the pressures the patient feels from Mr. Jones across the street, from the grocer, from friends in church. The pressures come from a sense of self blame, shame, and, of course, a projection of his own formerly held ideas of mental illness. They are mostly imaginary fears. He expects to be viewed critically. He must always smile, must never show anything but courtesy and respect, must always hold himself in check. Anger is forbidden.

Certainly there may be a stupid acquaintance

who might make disparaging remarks about his mental competence, but this isn't average Mr. Jones. Slips of the tongue do occur, but the doer usually feels the worse for this, not the patient. Fortunately through the medium of mass communication, (T.V., popular magazines, and the like) mental illness is becoming a subject of conversation. By this process it has come to be thought of as an illness. The notion that mental disease is a state of being possessed by the devil has largely disappeared but not entirely. The suspiciousness and hostility with which quite a few still regard the convalescent mental patient suggest how strongly we fear mental illness and how long it has been linked to the supernatural.

THE REHABILITATION of the patient must be considered in terms of returning to work. This is a segment of the community but because of the role of the plant physician there are considerable differences. The role of the industrial physician differs from the general practitioner because the GP usually has very little to say concerning working conditions or capacities.

The hospitalized emotionally ill worker needs more attention from the plant physician than the average hospitalized medical or surgical case. He may feel friendless, and, in fact, may feel there has been a conspiracy to beat him out of his job. He may blame the doctor if the doctor made the original psychiatric referral.

Maintaining contact with the patient either directly by visits or by letter can be quite important. Even the sickest patient has a core of awareness and, though friendly overtures are ignored, they are not forgotten. The patient cannot and will not ask for favors when he is sickest, yet this is when he needs help most.

Another function the plant doctor can perform is the maintenance of information channels to the foreman and personnel office. "Out of sight out of mind" is an old cliché, but in the case of the emotionally ill it has even more importance. The foreman may be quite glad to hear of the progress of one of his men and the personnel officer may need an occasional forecast with which to plan.

When the worker is convalescing, questions must be answered concerning his capacity to resume his job. The industrial physician may have the problem of determining just how far to go with management in suggesting changes of job, changes of foreman, changes in hours. As long as the patient is kept in mind, the problems of evaluation becomes more simple.

A rather basic attitude for the plant physician to maintain is simply that the patient has been ill. The average physician has difficulty inquiring into a returning worker's mental status. Evaluating the returning orthopedic, medical, or surgical case is usually thought of as being straightforward, but something seems different with the returning psychiatric case. The doctor feels awkward and hesitant. Some physicians may deny they are anxious, and bluster through the interview, winding up with a backslapping "there's-a-good-fellow" routine. In neither case has the doctor come to a comfortable conclusion unless the patient by some stroke of persistence has blurted out how he feels. A simple, honestly-put question as to how the patient views his ability to "cut the mustard" may be the most important thing in the world to him. Unless the returning patient feels his plant physician understands him he may not be sure he is wanted and may quit his job. The simplest and most direct approach is probably the best: "Charlie, come on in and let's talk about the job. What do you think about coming back to work? How strong do you think your emotions are?"

The patient probably won't want to dwell on his hospitalization experiences. If he wants to talk, he should be allowed to. If he doesn't want to talk he may be gently reminded that the physicians duty to the returning worker includes making some evaluation of his state of mind.

One of the most important functions a plant physician can perform is to become involved in the psychiatric follow-up. A psychiatrist may have urgently suggested outpatient psychotherapy but the patient may have just as vigorously ignored the recommendation. The plant physician is in a position to withhold the return-to-work recommendation, unless the patient complies. Coercion is not the best method, but not every returning patient has full insight into needs for further treatment.

In any medical or surgical case follow-up visits are necessary for full evaluation. In a psychiatric case, the plant physician should make appointments beyond the initial return interview for similar reasons. The full purpose may be explained to the worker and a schedule of visits set up. The physician will in this way cement the relationship and find he is doing some counseling beyond simple evaluation.

No matter how the industrial physician enters into the rehabilitation program his participation has a salutary effect. The most important contribution the physician makes is helping the patient get back on the job. If the worker is evaluated and back on the job he has returned to his breadwinning status. He feels wanted, worthwhile, and, we hope, confident. He resumes his role as man of the house, and his stature in the community is again stabilized. A working man is still the prototype of the American ideal. A large segment of resistance is wiped out the day he punches the time clock again. He is on an equal footing with Jones across the street, and next Sunday he may put a little extra in the collection box, just for good measure.

PROPHYLAXIS, preventive medicine, is the goal of psychiatry as it is with most specialties. Many people never get to the hospital but may seek or need some form of charging their emotional batteries. The problem often lies not so much in the working hours but what occurs after hours. Interplant clubs, work groups, 20-year, 40-year clubs and the like tend to cement together the workers over and above what the union

memberships may provide. Church groups, civic clubs, and sport clubs provide social interplay in the community.

The plant can offer as much and may provide better, closer organizations. When a group of workers get together they also talk shop. Contrary to the opinion of most wives this is a relatively healthy occurrence and it certainly creates a medium of emotional and intellectual exchange. The familiar things must be pleasant and acceptable before new experiences can be tolerated, and this is especially true of the emotionally handicapped. The plant physician may be called on to organize such groups and even participate in them.

It is no coincidence that many treatment features in the hospital have parallels in the external environment. Other than the so-called specific treatments such as shock treatment, insulin, and the ataractic drugs, most of the milieu treatment is not much more than that which we would call healthy, prophylactic community relationships.

Treatment, rehabilitation and prophylaxis can be thought of collectively as a continuum, one to the other, being only quantitatively different.

Treatment is a concentrate of rehabilitation, as rehabilitation is only a concentrate of the prophylactic, healthy, community interactions. This formulation may seem an oversimplification but much of the mystery of how the emotionally ill are treated is hopefully removed. The principles of rehabilitation and preventive psychiatry are, in turn, hopefully clarified.

Psychiatric Treatment

Brief Psychotherapy Procedures for the Industrial Physician

LEONARD E. HIMLER, M.D.
Ann Arbor, Michigan

THE TRANSITION *from Standard Medical Procedures to Individualized Psychotherapy*:

It is admitted that psychotherapy in industry —as in private practice—is still more of an art requiring a constant intuitive response to the patient than it is an exact science. The tactics must be flexible and subject to change at any point in the therapy.

Ordinarily a patient expects the physician to tell him what to do, and in return for doing as he is told he expects the physician to cure him. In psychotherapy the patient must be taught to play a more responsible role, and the physician must be prepared to prescribe himself as therapy. In this role he functions variously as a guide, confidant, counselor, teacher, friend, and protector.

Industrial physicians sometimes drift into psychotherapeutic relationships without having formed any comprehensive plan which is based soundly on goals and objectives applicable to their individual setting. Work under pressure and the need to accomplish as much as possible in the limited time available may make careful application of even limited psychotherapy seem impossible. As a result, the physician may feel it imperative to fall back on quick intuitive impressions in an attempt to give the patient prompt relief from at least his most pressing difficulties. There are few industrial physicians who would not derive benefit from better application of the techniques of brief psychotherapy to their daily work.

Most employees coming to the Medical Department will think of themselves as suffering from some physical handicap, illness, or injury. At first they may tend to ascribe any discernible emotional disturbances to difficult external situations or to the behavior of others. Many will be unaware of the difficulties within themselves which have contributed to the problem.

It follows that the physician must first meet the employee on his own ground, tentatively accepting the patient's own view of the problem. When an adequate survey of the physical factors has revealed no cause for the patient's complaints, it becomes necessary as a first step to explain how feelings and emotions may give rise to disturbances of bodily function.

When the employee blames external environmental conditions, it is necessary to explore with him both how this external problem has arisen and what possibilities there are of finding a satisfactory solution for it. Here the physician observes how realistically the patient is able to discuss his problem, whether he is able to face issues squarely or projects the blame elsewhere, and how far he may be torn between alternatives that are quite incompatible with each other.

Some patients provide a remarkably clear picture of the psychogenesis of their difficulties. Others, in spite of a quite rational account of the external events, seem incapable nevertheless of grasping the emotional importance of the occurrences and situations they describe. Here the physician must listen with ears sensitized to any hints of the patient's affective attitudes toward the events that he is relating.

A quick survey of the patient's life and work history will furnish the physician some knowledge concerning the normal satisfactions open to him, along with some of the past and present obstacles. Opportunity may present itself to relate some of the problems and symptoms occurring on the job to similar experiences occurring in the home or in the patient's adjustment elsewhere. By watching for hints of emotional reactions under various circumstances, it will be possible to piece together a fairly good impression of what constitutes the individual's most disturbing problem. The physician should try to sense the dominant trend and trace the disturbed affect back to its earlier sources.

The plan of therapy involves moving from a tentative acceptance of the patient's own view of his problem, to a gradually widening exploration of related emotional experiences. The key revelations which tend to work themselves to the sur-

face in the discussion form the basis of the unique shared relationship which constitutes the core of the therapy. Improved insight and self-understanding, with release from fear and other hampering emotions, lead to resetting of goals more in harmony with the patient's real situation.

AN APPROACH *to the Treatment of Psychoneurotic Reactions in Industry*:

As in private practice, half of the work of industrial physicians is concerned with emotionally upset individuals and those with some degree of neurosis. Neurosis occurs as a failure of the ego to perform its daily functions of securing adequate gratification of basic needs for security, social relationships, and love under the existing external conditions. Neurotic tendencies lie latent in every person. When the individual is exposed to difficulties beyond his powers of adaptation, these latent tendencies may result in an acute neurotic state.

When an acute neurotic disturbance develops under the pressure of unusually difficult external conditions, the ego's functional capacity is only temporarily impaired. In such cases the therapeutic task consists in first reducing the intensity of acute anxiety or other incapacitating emotions. As the patient's confidence in himself is restored he will be able to face the situation and make a more effective adjustment to it. If such acute reactions are not properly treated they are likely to become chronic.

The industrial physician frequently sees individuals who have developed hostile attitudes and impulses under the impact of unsolved problems and a mounting sense of frustration. If the central problem can be solved or ameliorated, frustration will subside and the resultant hostile impulses should disappear. It is often possible to eliminate hostile impulses by digging behind and uncovering the problems which gave rise to them without focusing attention directly upon the hostility itself.

More than palliative treatment is not possible for workers who exhibit chronic neurotic reactions or who have warped or weak ego structure, whether constitutional or acquired. In such cases supportive therapy can best meet the patient's need for assistance by actual guidance of his daily routine of activities. "Inferiority feelings are not traced back to their origin but are combated with reassurance; guilt feelings are not explained but are assuaged by permissive attitudes; anxiety is relieved by the physician assuming a protective role. Permanent change in personality structure is not expected. The effectiveness of such purely supportive treatment is often limited, and repeated contacts ever a long period may be required."[1]

Disturbed experiences in interpersonal relationships as a cause of emotional disorder, acute or chronic, make up a large part of the daily practice of industrial medicine. A majority of such neurotic conditions may be viewed as failures of adjustment by individuals to social living.

The conflict between help-seeking dependence and self-assertive rivalry finds expression in such disorders as peptic ulcer and hypertension. Patients in the former group defend themselves against their immoderate need to be loved by an exaggerated display of efficiency and accomplishment; and the latter are caught between their hostile competitive tendencies and their passive dependent wishes.

The aggressive protest of an alcoholic against his dependent cravings may take such disturbing forms that he may be rejected as beyond the physician's sphere of responsibilities. "If the physician overcomes this irritation and feeling of hopelessness, and looks for the rationale behind the disturbing behavior, he will discover that this aggressive protest is only an excessive—(but at the same time, a futile)—manifestation of the very incentive that must be utilized in helping him learn to play a more independent role. At first the alcoholic is so ashamed of his intense dependent cravings that he must use all his aggressive energy in attempts to deny them. If some of these dependent needs can be satisfied in the transference relationship that is established, the intensity of the dependent cravings may be diminished, and shame will be replaced by insight into the universality of the need for dependent gratification."[1]

Industrial physicians are aware that emotionally disturbed persons, whether recognized as such or not, exert a tremendous influence on others, not only in the home as fathers and mothers, but also as fellow-workers, foremen, executives, and union leaders.

Psychoanalytic principles and techniques can be applied to the treatment of persons suffering from the various types and degrees of emotional disturbance encountered in industrial medical practice. The plan of treatment must be based on a dynamic-diagnostic appraisal of the employee's personality and the actual problems he has to solve in his life situation, both at home and at work.

PRINCIPLES *and Techniques of Brief Psychotherapy*:

"Brief psychotherapy is treatment consisting of one, two, or three interviews. Its efficacy depends upon (1) the physician's ability to see at once the precipitating difficulty in relation to the patient's total personality; (2) the capacity of the patient's ego for insight and his ability to use this insight to make changes in his life, and (3) the ready confidence of the patient in the physician whose role fitted the particular case."[1]

Psychoanalysts have found that therapeutic results can be achieved without the patient's recalling all important details of his past history. It should be remembered that the neurotic employee is suffering not so much from his memories as from his incapacity to deal with his actual problems of the moment. The past memories have merely prepared the way for the present difficulties.

Simple "confession" by the patient of matters about which he previously had been unable to

memberships may provide. Church groups, civic clubs, and sport clubs provide social interplay in the community.

The plant can offer as much and may provide better, closer organizations. When a group of workers get together they also talk shop. Contrary to the opinion of most wives this is a relatively healthy occurrence and it certainly creates a medium of emotional and intellectual exchange. The familiar things must be pleasant and acceptable before new experiences can be tolerated, and this is especially true of the emotionally handicapped. The plant physician may be called on to organize such groups and even participate in them.

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Industrial physicians sometimes drift into psychotherapeutic relationships without having formed any comprehensive plan which is based soundly on goals and objectives applicable to their individual setting. Work under pressure and the need to accomplish as much as possible in the limited time available may make careful application of even limited psychotherapy seem impossible. As a result, the physician may feel it imperative to fall back on quick intuitive impressions in an attempt to give the patient prompt relief from at least his most pressing difficulties. There are few industrial physicians who would not derive benefit from better application of the techniques of brief psychotherapy to their daily work.

Most employees coming to the Medical Department will think of themselves as suffering from some physical handicap, illness, or injury. At first they may tend to ascribe any discernible emotional disturbances to difficult external situations or to the behavior of others. Many will be unaware of the difficulties within themselves which have contributed to the problem.

It follows that the physician must first meet the employee on his own ground, tentatively accepting the patient's own view of the problem. When an adequate survey of the physical factors has revealed no cause for the patient's complaints, it becomes necessary as a first step to explain how feelings and emotions may give rise to disturbances of bodily function.

When the employee blames external environmental conditions, it is necessary to explore with him both how this external problem has arisen and what possibilities there are of finding a satisfactory solution for it. Here the physician observes how realistically the patient is able to discuss his problem, whether he is able to face issues squarely or projects the blame elsewhere, and how far he may be torn between alternatives that are quite incompatible with each other.

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When an acute neurotic disturbance develops under the pressure of unusually difficult external conditions, the ego's functional capacity is only temporarily impaired. In such cases the therapeutic task consists in first reducing the intensity of acute anxiety or other incapacitating emotions. As the patient's confidence in himself is restored he will be able to face the situation and make a more effective adjustment to it. If such acute reactions are not properly treated they are likely to become chronic.

The industrial physician frequently sees individuals who have developed hostile attitudes and impulses under the impact of unsolved problems and a mounting sense of frustration. If the central problem can be solved or ameliorated, frustration will subside and the resultant hostile impulses should disappear. It is often possible to eliminate hostile impulses by digging behind and uncovering the problems which gave rise to them without focusing attention directly upon the hostility itself.

More than palliative treatment is not possible for workers who exhibit chronic neurotic reactions or who have warped or weak ego structure, whether constitutional or acquired. In such cases supportive therapy can best meet the patient's need for assistance by actual guidance of his daily routine of activities. "Inferiority feelings are not traced back to their origin but are combated with reassurance; guilt feelings are not explained but are assuaged by permissive attitudes; anxiety is relieved by the physician assuming a protective role. Permanent change in personality structure is not expected. The effectiveness of such purely supportive treatment is often limited, and repeated contacts ever a long period may be required."[1]

Disturbed experiences in interpersonal relationships as a cause of emotional disorder, acute or chronic, make up a large part of the daily practice of industrial medicine. A majority of such neurotic conditions may be viewed as failures of adjustment by individuals to social living.

The conflict between help-seeking dependence and self-assertive rivalry finds expression in such disorders as peptic ulcer and hypertension. Patients in the former group defend themselves against their immoderate need to be loved by an exaggerated display of efficiency and accomplishment; and the latter are caught between their hostile competitive tendencies and their passive dependent wishes.

The aggressive protest of an alcoholic against his dependent cravings may take such disturbing forms that he may be rejected as beyond the physician's sphere of responsibilities. "If the physician overcomes this irritation and feeling of hopelessness, and looks for the rationale behind the disturbing behavior, he will discover that this aggressive protest is only an excessive—(but at the same time, a futile)—manifestation of the very incentive that must be utilized in helping him learn to play a more independent role. At first the alcoholic is so ashamed of his intense dependent cravings that he must use all his aggressive energy in attempts to deny them. If some of these dependent needs can be satisfied in the transference relationship that is established, the intensity of the dependent cravings may be diminished, and shame will be replaced by insight into the universality of the need for dependent gratification."[1]

Industrial physicians are aware that emotionally disturbed persons, whether recognized as such or not, exert a tremendous influence on others, not only in the home as fathers and mothers, but also as fellow-workers, foremen, executives, and union leaders.

Psychoanalytic principles and techniques can be applied to the treatment of persons suffering from the various types and degrees of emotional disturbance encountered in industrial medical practice. The plan of treatment must be based on a dynamic-diagnostic appraisal of the employee's personality and the actual problems he has to solve in his life situation, both at home and at work.

PRINCIPLES *and Techniques of Brief Psychotherapy*:

"Brief psychotherapy is treatment consisting of one, two, or three interviews. Its efficacy depends upon (1) the physician's ability to see at once the precipitating difficulty in relation to the patient's total personality; (2) the capacity of the patient's ego for insight and his ability to use this insight to make changes in his life, and (3) the ready confidence of the patient in the physician whose role fitted the particular case."[1]

Psychoanalysts have found that therapeutic results can be achieved without the patient's recalling all important details of his past history. It should be remembered that the neurotic employee is suffering not so much from his memories as from his incapacity to deal with his actual problems of the moment. The past memories have merely prepared the way for the present difficulties.

Simple "confession" by the patient of matters about which he previously had been unable to

speak to anyone is found in practically every therapy. Through his confidence in the physician's objective, non-condemning attitude, the patient becomes able to confess disconcerting personal matters, and often gains immediate symptomatic relief. The therapeutic effect of confession does not depend on giving the patient insight into his deeper motives. The emotional reassurance and satisfaction which the patient derives from this relationship with the physician may lead to a disappearance of his symptoms.

In such therapy the physician uses his opportunity to help the patient see intellectually and at the same time *feel* the irrationality of his emotional reactions and thus make a new settlement of the old problem. Because the physician's attitude is different from that of the authoritative person or persons of the past, he gives the patient an opportunity to face again and again, under more favorable circumstances, those emotional situations which were formerly unbearable, and to deal with them in a manner different from the previous response.

Freud defined "transference" as the reaction to the therapist as though he were not himself but some person in the patient's past, i.e., some person who has at some previous time played an important role in the patient's life. In a wider sense the term refers to irrational repetition of stereotyped reaction patterns which have not been adjusted to conform to the present situation. In the so-called "transference relationship" the physician is representative of a figure of importance from out of the patient's past.

It is obviously impractical in the industrial setting to employ free association to bring about a repetition of the whole childhood situation with all its conflicts. The physician must rather concentrate interest on that phase of the transference situation around which the central conflict gathers. The physician uses the positive attitudes of the employee toward him to establish rapport and keep the curative process in motion.

An employee whose disturbance is due to ambivalence toward his father may displace onto the physician only the role of the good father, while his fear and hostility may be displaced onto his supervisor. It is not necessary for such a person to go through the experience of repeating these negative feelings, this time against his physician, in order to overcome them. It is necessary, however, that he be aided and advised regarding his animosity and that he see the relationship to his earlier confiict. In the transference situation the patient is first given an opportunity to see the same emotional conflict he had toward his father, and then to find a new, less neurotic solution for this conflict.

It is a fundamental part of all psychotherapy to teach the patient that his neurotic reactions are in accord with old, outmoded patterns, and to help him acquire new ways of reacting that conform more closely to the new situation. This is the part of the therapy that is called "reality testing." The function of therapy is thus one of facilitating a learning process.

Sometimes a patient's symptoms disappear almost dramatically with only brief contacts. This so-called "transference cure" is the result of the relief the patient derives from thus unburdening himself of his difficulties. It may within a period of time make possible a better adjustment to the real life situation, and with continued improvement the patient no longer requires the emotional support from the physician.

The physician must decide if his function is to be primarily supportive, which may or may not involve changing external conditions through transfer, leave of absence, etc., or if uncovering or insight therapy is indicated. Permanent change of the ego through insight and the emotional experience of the transference situation involves prolonged and complex reactions which go beyond the province of the industrial physician.

In general it is best to choose and space the interpretations in such a way as to focus the patient's attention upon only one problem at a time. When therapy consists primarily of giving emotional support, as in the industrial setting, there is little need of interviews more frequently than may be necessary to maintain this sense of reassurance and encouragement. In well-conducted therapy as much or more happens in the intervals between interviews as in the interviews themselves.

In brief psychotherapy the patient's attention should be focused upon his real present problem and should be turned to disturbing events in the past only for the purpose of throwing light upon the motives of irrational reactions in the present. Therapeutic change is based on the increased capacity of the ego to deal with the emotional constellations which were unbearable in the past. Patients gain the ability to face their intolerable insecurity only because of their great confidence in the physician. The therapeutic result is a process of emotional re-education in which old unsettled conflicts are re-experienced in a new, permissive setting, and with a new, constructive ending. By repetition, these corrected reactions gradually become automatic.

AIDS IN CONDUCTING *a Dynamic-Diagnostic Appraisal:*

The accumulated historical data, examinations, and dispensary notes usually constitute a satisfactory groundwork for brief psychotherapy when this is required in the industrial setting. It would be extremely useful if medical examiners also incorporated descriptions of personality factors as these arise in their routine contacts with employees. The need for attention to emotional disturbances, in any event, should be determined by positive evidence of their presence, not merely by the absence of organic findings.

Some physicians have difficulty in the management of the transition phase when it becomes necessary to shift emphasis from physical factors to the asociated emotional aspects of the patient's disorder. This phase is best handled by explaining simply that the absence of a physical disease does not preclude functional impairment which

can be just as troublesome, and that treatment requires exploration of possible causes in more detail. The patient should be given the clear impression that he shares responsibility with the therapist in this task.

The following are examples of the type of questions which are helpful in handling this opening phase of the contact:

Did anything unusual happen when the trouble first started?

Just what in your opinion was the cause?

Do you think you have been working too hard lately?

What seems to make the trouble better (or worse)?

Do you have more difficulty on or off the job?

Is this trouble tied up with anything else that is bothering you?

Does worrying seem to make it worse?

Have you been under any extra strain or tension recently?

Do you know of anyone else who had symptoms just like yours?

The intrapersonal conflicts which may have been revealed by the patient's responses to these questions should be worked through, with the goal of making conscious as much understanding of the relationship of symptoms to stress as the patient can accept. The physician at the same time gains an impression of the depth, complexity, and chronicity of the emotional element in the patient's situation. Confirmatory evidence of neurotic development will be revealed in further answers to questions such as the following:

Is it hard for you to relax at times? How?

How well do you sleep? Are you rested when you wake up?

Do you consider yourself "nervous?" In what way?

Do you think you are becoming a "worry-wart?"

Do you "blow up," get "high-strung," or lose your temper over trifles?

Do you think you have an "inferiority complex?"

Are you a perfectionist?

Is it hard to keep up with all the demands made on you?

What things make you blue or get you down?

While listening to the patient's account of his personal tensions, stresses, insecurities, frustrations, and anxieties, the physician will be in position to appraise the relationship of off-the-job problems to the individual's efficiency and interpersonal relations on the job.

In the discussion concerning work environment, the physician should note any tendency to bring in personalities, especially supervisors. Amplification of attitudes toward authority, fellow-workers, attendance, accidents, and other job-related problems may be explored with inquiries of the following type:

Does your job cause any special strains? Give examples.

Is your supervisor putting on too much pressure?

Are you satisfied with the way you are treated?

Do you get appreciation for what you do?

Is anyone picking on you? Is it a personal matter?

Do you find it hard to take orders sometimes?

Have you noticed if any other employees feel as you do?

Do you think the rules (attendance, safety) are too strict?

Have you had trouble of this type on other jobs?

The industrial physician of necessity is forced to restrict attention to the patient's home problems to those which show some direct relationship to efficiency at work. The decision as to where to draw the line is by no means simple, even on a minimal basis. Some of the more significant home, family and social problems and personal habits can be revealed through questioning along the following lines:

Do you have trouble getting away from home in the morning?

Do you think you have a well-balanced daily routine (work, rest, relaxation, avocation)?

Is it hard for you to keep on a regular schedule?

Does your family realize what you are faced with?

What does your wife think is the cause of your condition?

Do you have any worries about anyone in your home?

Do you get out enough?

Is the smoking and drinking you do related to your symptoms?

What help have you been able to get from people you have consulted (family doctor, minister, priest, relatives)?

The feeling of relief which comes after ventilation of his major areas of conflict may make the patient more amenable to suggestion. The physician should utilize this opportunity to point out what the patient can do for himself. The type of questioning which enlists the patient's participation and encourages him to proceed toward attainable goals is illustrated as follows:

Does this clear things up better for you?

What do you see ahead that you can do for yourself?

Would you like me to talk this over with your supervisor?

Is there anything more you think the company, Medical Department, or supervisor should do about this matter?

Should your own physician be consulted?

Do you think we need to call in a nerve specialist?

Has it helped you to talk the whole thing over?

Tell me what you are going to do about this matter now.

Will you let me know in a few days (weeks) how things work out?

Follow-up interviews (including those which the physician initiates himself) should include a brief review of the main features of this therapy which the patient has been carrying out. Reinforcement of the patient's efforts at self-help can be made with positive suggestions and reassurances, as follows:

Are you satisfied with your progress?

What else do we have to do to improve your condition?

Have you come to any more conclusions regarding the cause?

Are you sure you understand your condition better now?

Have you reason to believe you can manage things from now on?

Are you getting along satisfactorily with your supervisor now?

Do you have your confidence back?

What do you think should be our next step?

Will you let me know if you need further help?

Summary

PSYCHOTHERAPY in the industrial medical setting should be planned and carried out in accordance with sound psychodynamic principles. The industrial physician will require skill in making diagnostic appraisals focused primarily on presenting problems and symptoms, with minimal investigation of past conditioning experiences and unconscious motivation. Brief psychotherapy in this specialized relationship utilizes a variety of techniques, including non-directive questioning, confession, reassurance, suggestion, referral, and follow-up contacts, all dedicated to the practical objective of emotional re-education as may be required for each individual case.

(Mercy Hospital, 4038 Jackson Road).

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What's Wrong With You?

MUCH of the medical material that comes to my desk consists of statistics on various diseases. Fund raising organizations obviously give the maximum figures on the incidence of the specific disease they are interested in. One day in a pixie mood, I made a partial tabulation, which came out this way (see Table). This adds up to more than 37 million and does not include the deaf and those handicapped by accident, polio, headaches, skin disorders, and gastro-intestinal ailments. I am skeptical of these estimates. I doubt if every third or fourth person we meet on the street has an illness of this nature. I'm reminded of figures produced during the height of the campaign for socialized medicine. Let's say our population at that time was 150 million. This report claimed that 150 million Americans were disabled. How was this conclusion reached? Simply by broadening the definition of "disability." A person was disabled if he could not engage in all gainful occupations. A woman with a sore finger could not type and was disabled, therefore, even though working as a model. A healthy 50 year old lawyer passed his physical for insurance but was "disabled" because he could not dig ditches. I will buy a definition of "disability" if it refers to the occupation for which the person was trained. A general practitioner, for example, cannot practice medicine if he becomes allergic to penicillin and develops hives or asthma on handling the drug. He is "disabled" so far as his chief occupation is concerned. All this is bound to have repercussions. Dr. Lester Coleman, in his book, "Freedom from Fear" (Hawthorne Press), ironically sums up the effect of such health propaganda campaigns: "If we were to believe all the distorted, fear-provoking statistics spoon fed to us through all media of communication, this is what our destiny would be like: By 1968, one out of five of us would be dying of cancer, while one out of 20 would be in a mental institution. We would be visited in the hospital or asylum by one of our children a victim of cerebral palsy or polio, while our second child would be ill at home with rheumatic fever. The third child would be forced to go to his psychoanalyst alone. Mind you, this could happen only if we were fortunate enough to have escaped heart disease, tuberculosis, arthritis, and smoking cigarettes—and if we had not previously been destroyed by Fourth of July or Memorial Day accidents. It is not an overstatement to say that in addition to the increased monies that have been contributed to these campaigns, we have paid a great price in loss of composure and in added anxiety."

Disorders of heart and circulation	14,000,000
Apoplexy	1,800,000
Cancer	700,000
Mentally retarded	2,400,000
Problem drinkers	3,800,000
Tuberculosis	400,000
Arthritis	10,104,000
Visually handicapped	1,700,000
Cerebral palsy	500,000
Multiple sclerosis	250,000
Muscular dystrophy	200,000
Parkinson's disease	1,250,000

—THEODORE R. VAN DELLEN, M.D., in his "How to Keep Well" column in *Chicago Tribune*, March 4, 1956.

The Traumatic Abdomen

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THIS PRESENTATION will be confined entirely to non-penetrating wounds of the abdomen because these injuries present more difficulty in diagnosis and management. They are also more common in civilian practice, and are more often associated with severe injuries in other parts of the body. In non-penetrating wounds there is more disagreement as to the necessity for operative intervention and as to the optimum time for surgery if it is deemed advisable. Conversely, penetrating wounds generally get immediate attention and often the final diagnosis is made on the table.

I am omitting, as beyond the scope of this paper, any discussion of the various forces causing abdominal injury and any discussion of operative procedures or technique, such as incisions, drainage, or anesthesia. References to war time cases are also omitted because of the unavailability of case histories, x-ray films, etc. The purpose will be an attempt to show:

1. That any abdominal injury is serious and that any person with abdominal trauma, due to blunt force, even though first appearing slight, should be hospitalized, since the clinical impression differs with the stage of the injury.

2. That since the severity of an injury can often not be determined immediately, the surgeon must "live with his case," until a definite diagnosis is made and definitive therapy has been carried out.

3. That, whenever possible, diagnostic procedures and the treatment of shock should be carried out simultaneously.

4. That in a moderate percentage of cases, multiple lesions are present.

5. That pre-existing abdominal pathology, medical or surgical, may complicate the picture and increase the diagnostic difficulties.

6. That early, a ruptured viscus may produce few signs and that delayed rupture and late sequelae are relatively common.

7. That delayed rupture, presents not only a more difficult diagnostic problem but also presents a poorer prognosis and must be constantly kept in mind.

8. That conservatism does not have a conspicuous place in the management of these types of cases, and in most instances it is much better "to look and see rather than to wait and see."

Presented at the Sixty-Eighth Annual Meeting of the AMERICAN ASSOCIATION OF RAILWAY SURGEONS, Chicago, Tuesday, April 10, 1956. DR. COGLEY is Clinical Professor of Surgery, John A. Creighton School of Medicine, Omaha, Nebraska; Member Staff, Mercy Hospital, Council Bluffs, Iowa, St. Joseph and St. Catherine's, Omaha; District Surgeon, Chicago & North Western Railway; Company Surgeon, Chicago, Rock Island & Pacific Railroad; Company Surgeon, Chicago, Burlington & Quincy Railroad.

Treatment of Shock

OF PARAMOUNT importance in every case is the treatment of shock, if present:

1. Sufficient morphine should be given to relieve pain.

2. If there is no chest or head injury, the foot of the bed should be elevated.

3. Oxygen should be administered by nasal catheter, after an open airway is assured.

4. Blankets should be used; but one should avoid the detrimental effect of overheating.

5. Administration of sodium chloride, with 5% glucose, should be begun at once, switching to plasma or plasma expanders, if shock is without hemorrhage.

6. Whole blood should be started, as soon as available, if shock is due to hemorrhage.

7. Levophed, Solu-Cortef or similar agents may be indicated.

8. The Levine Tube, with suction is of particular value for several reasons:

(a) Diagnostic aid if blood is present in the stomach.
(b) Reduces shock if gastric dilatation is present.
(c) Therapeutic help, if a gastro-intestinal rupture.
(d) Prophylactic against adynamic ileus, gastric dilatation, and aspiration pneumonia.
(e) An aid in operative technique, if abdomen is to be opened.

Diagnosis

AS PREVIOUSLY mentioned, diagnostic procedures and the treatment of shock, should, where feasible, proceed concurrently.

Often, early diagnosis is extremely difficult, because the clinical picture may differ with the stage of the injury. Arbitrarily, we are often able to divide these stages into (1) the original shock period; followed by (2) the so-called "period of illusion," during which symptoms often improve, or even disappear. Then (3) this interval period may be followed by a period of aggravation.

We repeat that, early, an injured viscus may produce few signs. Tenderness and rigidity are often absent. Vomiting is generally absent early, appearing only with the onset of peritonitis.

Pain is nearly alway present, in a greater or lesser degree. There is, however, no relationship, between the severity of the pain and the serious-

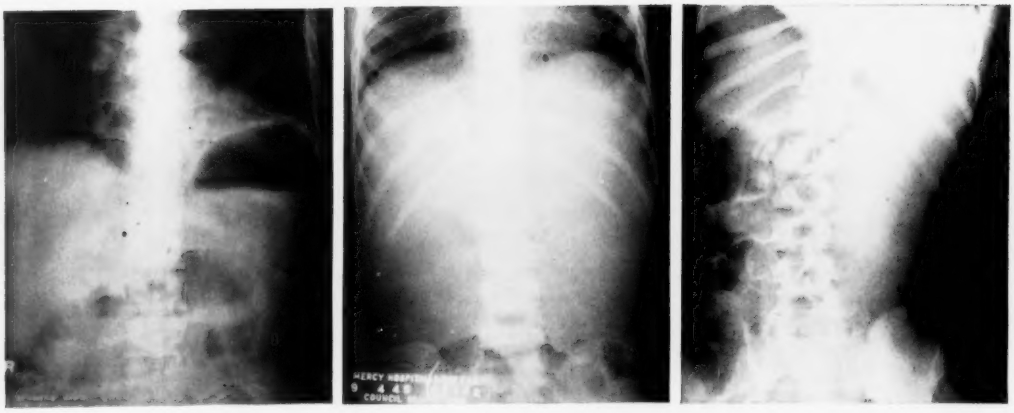

Fig. 1. Fig. 2. Fig. 3.

Fig. 1—Free air beneath diaphragm—defecation strain. Fig. 2—Traumatic pseudocyst of pancreas. Colon depressed into pelvis. Fig. 3—Retroperitoneal hematoma—ruptured kidney.

ness of the abdominal lesion. The same may be said of tenderness.

It is always to be borne in mind that thoracic cage injury and vertebral injury often produce spasm of the abdominal wall. On occasions we have found that intercostal nerve block has been helpful in a differential diagnosis in this situation.

One may also have the so-called "peritoneal shock," due to injury of the abdominal wall, without injury of a viscus, and have abdominal pain, vomiting and clinical shock. Most confusing, is the patient who has a ruptured deep epigastric artery, with all of the signs and symptoms of intra-abdominal bleeding. These two are nearly indistinguishable. Of even greater import, is the patient with a ruptured epigastric artery and associated visceral injury. More often the wall injury produces the major group of symptoms, at least early. Improvement occurs, and the intra-abdominal injury is temporarily neglected.

It is to be remembered that clinical shock that fails to respond to adequate treatment, must be considered hemorrhage.

Diagnostic Procedures

1. REPEATED and meticulous examinations of the abdomen, including hernial openings, noting tenderness, spasm, rebound, and masses. I would like to suggest, that the testing for rebound be omitted until the end of the abdominal survey. If one hurts the patient early in the examination, much voluntary rigidity results.

2. Pulse and blood pressure every 15 minutes.

3. Voided urine specimen if possible, otherwise catheterized.

4. Rectal examination to determine (a) blood in lower G-I tract, (b) bulging in the cul-de-sac, (c) spicules of bone from pelvic fractures, and (d) crepitation of air in pelvic connective tissue.

5. Diodrast cystogram, if bladder is suspected. Intravenous pyelogram, if hematuria.

6. Cystoscopy if further doubt.

7. Survey film of the abdomen, (a) supine (b) erect, and/or left lateral decubitus.

8. Peritoneal aspiration is of doubtful value and often dangerous. A small incision under local is more informative and safer. This can be enlarged, up, down or across.

9. Leucocyte count is of doubtful value.

10. Repeated red blood counts and hemoglobin determinations may indicate the presence of shock or hemorrhage. Repeated serum protein determinations and hematocrit readings may be more significant.

If the patient is conscious and cooperative or if a near relative is present, it is wise to inquire if Cortisone or insulin is being taken. This may be helpful information in the future conduct of the case.

What help may we expect, and what should we look for in "survey" or "scout" films of the abdomen? I do not know why, but it has been our experience that two supine films, even though taken a few moments apart, are more instructive than one, perhaps due to a minor difference in technique. Erect films are also essential, if possible. In lieu of this a left, lateral decubitus. An additional chest film is also advisable.

Helpful Positive X-Ray Findings

1. GAS beneath diaphragm if erect film, or beneath liver and right lateral wall, if lateral decubitus. As little as 4 cc. of free air will show.

2. Free air around the right kidney in extraperitoneal duodenal rupture.

3. In a retroperitoneal accumulation, a localized homogeneous shadow, generally pushing the colon mesially.

4. A hemogeneous shadow, generally displacing the transverse colon downward, in large accumulations in the lesser sac.

5. Any abnormal mass or shadow.

6. Loss of one or both psoas shadows.

7. Spleen, liver or kidney shadows, visualized, normal or abnormal.

8. Biliary or urinary stones.

9. Fractures of pelvis, lower ribs, or vertebrae.

10. Indentation on gastric wall, a gas outline,

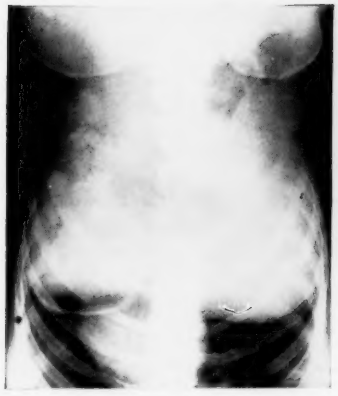

Fig. 4. Fig. 5. Fig. 6.

Fig. 4—Ruptured kidney. Extravasation of dye. Healed without surgery. Fig. 5—Traumatic diaphragmatic hernia. Fig. 6—Retroperitoneal hemorrhage—pressure on bladder.

or displacement of the stomach, especially in spleen cases.

11. Herniation through a hiatal dehisence.

12. Presence of an ileus. The ileus picture may be confusing. It may obscure pathology, otherwise visible. Then too, some of the most extensive cases of ileus are caused by rib and vertebral fractures, minor tears of the diaphragm, and even contusions of the abdominal wall.

The Case for Conservatism

THERE has been a growing tendency, among some groups, to consider certain cases of abdominal injury, notably trauma of the liver and spleen, with shock controlled, as not requiring surgical intervention.

In our experience, we feel much safer, in these borderline cases, if we explore. True, you may do nothing after you are in the abdomen, and true also that many would do well without surgery. The diagnosis, however, is so often in doubt, delayed rupture of hollow or solid viscera is so common, and multiple lesions are so frequent, that one had best "sin on the side of right."

We recall several cases, doing well, up and about, only to have sudden pain, severe shock, and in two cases fatal terminations. One was a subcapsular spleen rupture, which had been incorrectly diagnosed. The man, on his way to a sanatorium for treatment of a left tuberculous infection, was in a railroad wreck, sustaining multiple rib fractures, principally on the left. He did well on a conservative regime. He was up and about the hospital on his fourteenth day when he had a severe, sudden and fatal bowel hemorrhage. Autopsy revealed rupture of the spleen into the splenic flexure of the colon.

We also recall two children of the same age, in the hospital the same day, both sled accidents and both spleen injuries, one complicated by hematuria, from kidney contusion. Both had completely controlled shock, but both had delayed ruptures and severe hemorrhages. Each of these children had normal spleen shadows on x-ray.

We have had two cases of pseudocysts of the pancreas, developing 14 to 16 days post-trauma. The late sequelae are also distressing. Recently reported are two cases of traumatic bile cysts of the liver, both coming to surgery weeks after the original injury, and one case of submucosal hematoma of the colon, operated upon, years after the causative trauma.

Optimum Time For Surgery

EVEN THOUGH our diagnosis is relatively certain and laporotomy is definitely indicated, the optimum time for exploration is often most difficult to determine, especially if the case is seen in severe shock.

If response to shock treatment is satisfactory, and pulse and blood pressure remain stabilized for an hour or so, exploration is probably permissible.

If response to treatment is evanescent, and a short period of recovery is followed by a relapse, we must conclude that bleeding is continued and severe and exploration should not be delayed. Blood should be available in adequate quantities and should be running, preferably in two veins, when the incision is made.

If treatment for shock has been adequate, continued and intensive, and no response has been obtained and we are relatively certain that nothing, outside of the abdomen, is responsible for the shock, the case is probably hopeless. These cases are a distinct challenge to the surgeon and require some fortitude, but it is our opinion that often nothing is lost and occasionally a life may be salvaged by exploration.

Multiple Lesions

WE REITERATE, one must always be watchful for multiple lesions. Frequently a severe fracture of the extremity, pelvis or spine, a crushing chest or head injury with unconsciousness can overshadow the abdominal lesion. These are often baffling, because of the pain, spasm, and ileus.

Even when one is inside the abdomen, he must be alert for multiple lesions. It is so easy to miss a retroperitoneal duodenal or pancreatic lesion, especially if it occurs with a massive hemorrhage of the spleen, or liver.

Fig. 7.
Fractured pelvis and ruptured bladder.

Multiple lesions occurred in 28% of our cases. Common combinations were:

1. Fractured ribs and ruptured spleen.
2. Fractured ribs and torn liver.
3. Fractured ribs and ruptured kidney.
4. Fractured ribs, vertebrae, pelvis, and ruptured bladder.
5. Ruptured spleen and duodenal tear.
6. Ruptured epigastric artery and ruptured mesenteric vessel.
7. Ruptured spleen and kidney contusion, with gross hematuria.
8. Rupture of liver and kidney contusion, with moderate hematuria.
9. Fractured ribs, strangulated hiatal hernia, and jejunal tear.
10. Ruptured kidney and colon laceration.

These, I repeat, were the common combinations. Isolated instances of multiple injuries are too numerous to mention. I would like, however, to call attention to one that fortunately has occured only twice in our experience. A severe head injury with unconsciousness and definite signs of abdominal bleeding; in both cases, traumatized spleens. I can think of no situation demanding a more astute diagnosis or a more carefully planned therapeutic priority.

The Presence of Pre-existing Pathology

WE HAVE encountered few references in the literature, concerning the pre-existence of pathological conditions in the traumatic abdomen. It occurred in 21% of our cases. It might be of interest to enumerate some of them.

1. An elderly man, reducing his own inguinal hernia in erect position in a small washroom in a cafe, ruptures his own ileum.
2. A man with an empyema of the gallbladder arises from bed to go to the bathroom to emese, falls downstairs and sustains multiple fractures, including vertebrae and ribs.
3. A man, defecating with strain, ruptures a sigmoid diverticulitis.
4. A man with a left-sided tuberculosis, on the way to a sanitorium is in a wreck and fractures his left ribs and spleen.
5. A man with peptic ulcer, leans over a rear window of a street car to restore the trolley, slips and hits the abdomen sharply, rupturing the stomach through the ulcer area.
6. A boy with bilateral polycystic kidney, falls in a corn crib and fractures one kidney.
7. A man with a poorly fitting inguinal truss, is bumped with a tractor and ruptures his ileum.
8. A young man, delivering milk, slips and falls, striking a curb stone, rupturing a chronically enlarged leukemic spleen.
9. A coal shoveler falls asleep on the ground between loads. A truck runs over his abdomen, fracturing ribs, herniating stomach into hiatal opening and rupturing jejunum.
10. A baker, pulling a towel off of the wall, bumps his abdomen with his elbow and fractures a large spleen of acute mononucleosis.

Liver Injuries

STATISTICALLY, the liver is the most commonly injured intraperitoneal organ. In our series, this has not held true. The spleen was first and the liver second. The liver should be extremely vulnerable, because it is large, fixed and fragile. Injuries may be slight, often escaping detection, or severe, with a complete fracture, hemorrhage and death. We believe conservatism is dangerous. Delayed bleeding does occur and associated lesions are often present, both in adjacent organs and those occurring in the ducts.

Spleen Injuries

PRACTICALLY everything that has been said regarding liver injuries is also true of spleens. Delayed bleeding is perhaps more common and associated lesions less so. Most constant signs are localized pain and tenderness in the upper left quadrant, often radiating to the shoulder, with occasionally a palpable mass and dullness.

Kidney Injuries

WE FEEL considerably more conservative with regard to kidney injuries. Most frequently they are not emergencies, and only become so if there are excessive retroperitoneal hemorrhage, increasing shock, and peritoneal bulging. Many may be treated conservatively, and good terminal results are obtained. We have seen almost miraculous healing in severely damaged kidneys, with non-operative therapy.

Unless there is a definite contraindication, an intravenous pyelogram is most desirable to discover the extent of kidney damage, even though a conservative plan is to be followed. It becomes mandatory to determine the presence or absence of a contralateral organ if surgery is contemplated.

Hollow Viscera

THESE ARE less frequently involved in non-penetrating abdominal injuries than are the solid viscera. When such injuries do occur, it is an ab-

dominal emergency. It has been wisely pointed out that in dealing with abdominal injuries all diagnostic procedures are directed toward discovering if a hollow viscus is ruptured. While there is considerable disagreement among surgeons as to whether emphasis should be placed on the radical or conservative management of abdominal injuries, all agree that rupture of a hollow viscus is always an emergency.

Stomach

RUPTURE of a normal stomach is rare. Protection comes from the rib arrangement and the fact that the stomach normally is not distended.

Small Intestines

IF THERE IS A COMPLETE rupture, diagnosis is less difficult. If there is a bowel contusion, or mesenteric tear, few symptoms will be apparent until secondary rupture occurs, seven to 10 days later. Frequently, there is no large scale escape of gas, owing to the herniation of the mucosa and contraction of the bowel at the site of the injury.

Retroperitoneal Duodenum

THIS RUPTURE is always serious, always difficult to diagnose and also to repair. X-ray evidence of air about the right kidney may be helpful. Also, in the absence of thoracic injury, crepitation of air on rectal or vaginal examination is suggestive.

Pancreas

IN THIS group of cases, we have not seen a single case of severe, primary pancreatic laceration.

I have previously mentioned the case of the ruptured colon, following a defecation strain. In this case there was air beneath the diaphragm, and signs of early peritonitis. I have also mentioned the traumatic diaphragmatic hernia. The chest x-ray was most helpful in this case.

One case of rather severe intraperitoneal hemorrhage was due to a rent in the mesentery.

All of our cases of ruptured bladder were associated with pelvic fractures, and all repaired relatively early.

Summary

WE HAVE almost reached the conclusion that, with abdominal trauma, even in the presence of rib and vertebral fractures—yes, often with severe hematuria—with tenderness, spasm and peritoneal rebound, regardless of a normal pulse, blood pressure and count, the abdomen should be opened and an exploration done. We feel that if we are to err, it is better to sin on the side of right. In other words, "it is better to look and see than to wait and see."

The Railway Surgeons

Officers and Board members of the American Association of Railway Surgeons at an executive session of the 68th Annual Meeting, April 10-12, 1956, at Chicago. Left to right: Ray S. Westline, M.D., Raymond B. Kepner, M.D., Robert M. Graham, M.D., Arthur R. Metz, M.D., members of the Executive Board; Chester C. Guy, M.D., Secretary; Richard Sutter, M.D., retiring President; Ernest C. Olson, M.D., Board member; F. J. Parker, Assistant Secretary-Treasurer; Theodore L. Hansen, M.D., Treasurer; A. M. W. Hursh, M.D., Board member, and H. A. Spilman, M.D., President.

Industrial Medical Association

President's Page

DURING the 40 years since its first meeting at Detroit in 1916, the Industrial Medical Association has grown from a small band of pioneers, held together by similar interests and the friendships thus engendered, to a solidly built organization of specialists, impressive in magnitude, nation-wide in importance. The Industrial Medical Association has become so much a part of the national scene that from now on it will be prominently in the public eye—charged with a public interest. Its place in the national economy is unique and significant—unique because its 3,300 members are the health guardians of the millions who make up the country's employed population; significant because of the rapidly growing interest in its aims and purposes on the part of management, and the cooperation of management in their attainment.

This is well illustrated in the Health Achievement Award, given each year to management in recognition of the inauguration and maintenance of a comprehensive health program for employees. There were 17 companies on the list from which the 1955 Award winner was chosen. All were so outstanding that the selection of any would have been a proper choice. The task of the next Committee is not an easy one. Maybe there will have to be more than one Award. . . .

EACH new President of IMA assumes the responsibilities attending the office. With the growth and development of the Association, these—as every Past-President well knows—have never been inconsiderable. But now more than ever before each new President faces new and added responsibilities. The accelerating pace of modern life is already so rapid that, in a sense, he looks out upon a new and different world. For the Association this is a world wherein management in general is more conscious than ever of the place and importance of industrial medicine and all that it stands for. It is a happy augury for me, and for all of us, to know that however new, however demanding these responsibilities may prove, the Association has the capacity to meet them and take their full measure.

E. S. Jones M.D.

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Specialty Certification Through Examination

THE EPOCHAL event for this period in the life of industrial medicine is the attainment of well authenticated specialty recognition. So significant is this that the long and still awaited history of the official association will be terminated as of the recognition date. In a just measure, that date may serve as the end of an era of struggle.

For many industrial physicians a new struggle appears--the struggle to obtain personal recognition as a certified diplomate within the specialty through prescribed examination. That examination (none is now scheduled) as one requirement will be concerned with general preventive medicine. This is no extraneous and arbitrary imposition, since in truth occupational health is an essential part of preventive medicine.

Few physicians, skilled as they may be in industrial medicine, may expect to joust with any rigorous preventive medicine examination without refresher training and end up the victor. Part of the necessity for creating a body of founders, that group freed of all examination requirements, springs from the recognition that least of all could that group survive a rubric test. That group has been swathed in distinction from past and present performance in lieu of retained technical proficiencies in preventive medicine.

Those of the second echelon, the ones called upon to undergo examination are by implication the flattered ones. They are accorded the trust of possessing capacity to emerge successfully from any reasonable examination. The awful truth, to be voiced only in whispers, is that the majority of that group scarcely is more proficient than the indulged grandfathers.

If that which precedes is to be rated as verity, it serves as an arrowing finger to a necessity. That necessity is the planning and consummation of intense training endeavors. If the candidates' shortcomings related to occupational health directly, the matter would be a Herculean task. Since the training required is apart from occupational health and reaching into general preventive medicine, the task becomes super-Herculean.

Because no plans are in evidence, it becomes permissive to raise some pertinent questions:

Should larger corporations with sizable organized medical staffs go about their own staff training through appropriate courses?

Should the American Board of Preventive Medicine directly or indirectly sponsor, organize, and coordinate training procedures?

Might the objectives sought be accomplished through correspondence courses, and, if so, who shall undertake this correspondence institute?

Should the several university schools of public health and strong departments of preventive medicine in medical schools be importuned to provide brief intensive courses? If so, who shall plan their content and how will such courses become known to prospective trainees?

Believing that a variety of training facilities will be devised to meet the demands of candidates, it becomes proper to inquire what is likely to prove the optimum economic arrangement?

Always seeking to avoid the distasteful "cram" course, would two weeks or one month of intensive full-time in-residence training suffice? If not what is a minimal acceptable time? If so, how many such training loci should serve? Should such numerous programs be so staggered in time as to suit the time needs of trainees? How often should the most successful of these projected programs be repeated?

That last question is susceptible of temporizing answer. The first round of experience will determine repeat performances. All the foregoing is but a portrait of a perplexity—a dilemma calling for planful organizational leadership. If this be an obligation or opportunity for the American Board of Preventive Medicine, a voice should be heard. If this calls for action by the Directors of the Industrial Medical Association, that action is awaited but not for long.

Industrial Medicine's Size

IT IS NOW the fashion to style industrial medicine as the "newest" medical specialty. This fashion has been in vogue for nearly 40 years. In 1919 Mock, in his "Industrial Medicine and Surgery," mentions a "new" medical specialty in these words: "To the pioneers in this new specialty, however, it seemed that these industries offered a veritable human laboratory where the constant supervision of the health of thousands of employees would enable the development of a real system of preventive medicine and preventive surgery." Again, later in the text, "Industrial medicine and surgery, the new specialty, deals with the human maintenance problem in industry." Industrial medicine certainly grows old slowly, for 37 years later, in 1956, Shepard (see "The Practice of Medicine in an Industrial Society," page 201) perpetuates the newness of this specialty in this language: "The spotlight makes us wish to be sure our house is in order so that we can be justly proud of the honor of practicing the newest specialty in medicine."

Both of these authors possessed sound reason for the language employed, so that no discrepancy is involved. The important consideration is how sturdy has industrial medicine become in the family of medical specialties? The contributions of any specialty to the totality of medicine is not measurable in numbers alone, but this comment is confined to numbers.

Since the labor force of the land now approximates 64,000,000 persons, most physicians inevitably have industrial workers among their patients or their practices are influenced by the circumstances of industry, not omitting such specialties as pediatrics or obstetrics. By no method of reckoning are these physicians to be regarded as industrial physicians, yet in the aggregate they serve industry's medical requirements to an extent greater than all industrial medical specialists. Further, the number of physicians who designate themselves industrial physicians reflects little as to the actual number. Because of military demands for medical personnel, many physicians on the fringes of industrial medicine overemphasize that status in the hope of escaping military duty. That subterfuge is disturbing to statistical appraisals. Leaving all such uncounted, there remain some 9,000 physicians justifying the appellation of industrial physicians. Yet the majority are not specialists.

The current membership of the Industrial Medical Association approximates 3,300. The stringent requirements for membership identify these physicians as specialists, but by no means does IMA membership assure specialty certification by the American Board of Preventive Medicine. Many full-time industrial physicians are not members of IMA. Notwithstanding, the IMA roster affords the best basis for statistical presentations. Thirty-three hundred constitute only about 1.4% of the country's 240,638 physicians.

Weiskotten for many years has reported at intervals on specialization in medicine. His latest arrangement (*JAMA*, 160:15:1303 (April 14) 1956: "Trends in Specialization") embraces responses from 21,110 physicians who graduated in medicine in years ending in 5 from 1915 to 1945. His approach was a questionnaire of the "What are you doing now?" type. Dr. Weiskotten is the first to reveal that such tabulations are of scant value as to any one specialty. The outstanding contribution is in the disclosure of distinct trends into specialization and away from individualized general practice.

From the face of it this Weiskotten report would appear to indicate that industrial medicine —along with public health, ophthalmology, otology, and urology—is headed for some sort of splinter eventuality. In reality there are today more full-time industrial physicians than ever before. They are better trained and now provide medical services to more millions of industrial workers than at any past time. If as shown, the specialty of industrial medicine numerically is small—then, all the more room to grow whether it be the "newest" specialty or a hoary one!

PERCENTAGE DISTRIBUTION OF 21,110 MEDICAL COLLEGE GRADUATES WHO HAVE LIMITED PRACTICE TO SPECIALTY—BY SPECIALTY.

Specialty	Distribution by Year of Graduation						
	1915	1920	1925	1930	1935	1940	1945
Number in all Specialties	751	682	1,097	1,126	1,768	2,260	3,128
Eye, Ear, Nose, and Throat, %	22.5	18.2	16.7	13.0	11.3	8.6	6.5
Internal medicine, %	18.1	18.3	17.3	17.8	19.4	23.8	24.1
Surgery, %	20.2	15.5	18.5	17.7	20.0	24.0	21.1
Pediatrics, %	6.9	11.3	9.9	7.5	6.4	6.9	9.2
Gynecology and Obstetrics, %	5.9	6.7	6.8	5.6	10.0	10.0	8.4
Neuropsychiatry, %	4.7	6.6	5.8	12.5	8.1	6.5	8.2
Genito-urinary, %	5.3	5.9	4.7	4.1	3.4	3.1	2.9
Laboratory and radiology, %	7.6	8.6	8.4	10.8	7.9	8.6	9.6
Public Health, %	3.5	3.2	4.6	4.1	3.6	1.2	0.8
Industrial (Medicine & Surgery), %	2.4	1.3	1.4	0.7	1.1	0.5	0.5
Syphilology and dermatology, %	0.9	2.2	2.8	1.9	2.7	2.0	2.0
All others*, %	2.9	2.0	3.0	4.4	6.1	4.8	6.7

*Includes a few specialists who did not specify specialty.

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3. **Recovery from illness: pneumonia, poliomyelitis and the like.**
4. **Recovery from severe trauma or burns.**
5. **Nutritional care in wasting diseases such as carcinomatosis and tuberculosis.**
6. **Domiciliary care of decubitus ulcers.**
7. **Care of premature infants.**

*Trademark of G. D. Searle & Co.

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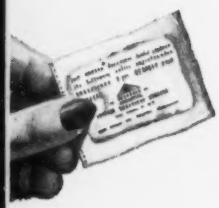

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News, Comment, Opinion

A WORKER on the job must be both willing and able to be there; if one of these conditions is not satisfied, he will be absent.

—LEMUEL C. MCGEE, M.D., Medical Director, Hercules Powder Company, at 16th Annual Congress on Industrial Health, Detroit, January 23-24, 1956.

Not Proved

ANALYSIS of comparable random samples of cases 20 years apart in the same internist's practice fails to substantiate the current belief that emotionally engendered disorders have shown an alarming increase and now constitute more than 50% of medical practice.

—From "Changing Patterns of Medical Practice," by ALLEN S. JOHNSON, M.D., in *New England J. Med.*, April 5, 1956; Author's Summary.

Text on Occupational Health

IN DECEMBER, 1954, a Panel of members of the ILO Correspondence Committee on Occupational Safety and Health adopted a text on "Guiding Principles for the Organization of Occupational Medical Services in Places of Employment." This text has been recently published by the ILO.

Feet

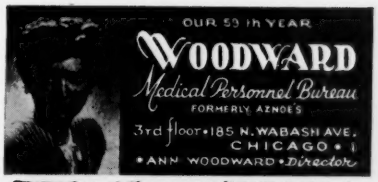
FOOT CLINIC reduces absenteeism 12% at three Buffalo plants of Duffy Silk Company, about 90% of whose 500 employees spend most of their working day standing. Five years ago corns, calluses, bunions, other foot troubles were common employee complaint. Company engaged podiatrist who held foot clinic one day every second week at each plant. Company pays entire bill.

—*Industrial Relations News*, March 17, 1956.

Motorized Health Centers

INTERNATIONAL Ladies Garment Union, AFL, plans to establish a fleet of 12 mobile units to serve the health needs of some 120,000 members in sparsely settled areas of the South, Midwest, and Far West. Patterned after a $35,000 unit already operating in Western Pennsylvania, the motorized "health centers" will be equipped with x-ray facilities, dressing rooms, and eye-testing machines. Each is to be manned by a doctor, a nurse, and a technician.

—*R.N.*, March, 1956.



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Ass't Medical Director: (c) M.S. (indus medicine); A.E.C. Fellowship; 3 yrs, med officer, USAMC; seeks indus medicine, with or without atomic installation, pref in Illinois or Wisc; past yr, gen'l pract in lge industrial center. early 30's.

Staff Phy: (d) Graduate, Hanneman Medical College; past 6 yrs, successful private gen'l pract; seeks indus medicine with regular hours, salary & security; early 30's; inter in indus med as career; any locality but prefers Pa., Va., or East.

Staff Phy: (e) MD degree, Duke; complet'g training in internal medicine; prefers indus medicine in Calif, Texas, Ohio, Pa., New Jersey; age 29; married, 1 child (4).

Staff Phy: (f) MD degree, Jefferson Medical College; 2 years, medical officer, USAMC; 3 years, private gen'l pract; desires indus med with regular hours; consider any large city but prefers New Jersey, Pa., New York. seeks indus med as career. age 30.

Staff or Assistant Med Dir: (g) MD degree, Hahnemann Med College; 15 years, Ass't medical dir, ass't dir and, now, admin dir, important Liberal Arts University; seeks indus medicine; experience, both clinically & administratively should prove valuable; present position offers little further oppor for development; mature man with sound values; any locality but prefers Penna or East. late 40's.

Staff: (h) Internal medicine & physical therapy interests; 18 years, successful private gen'l pract; desires to specialize in one branch of medicine; prefers full time appointment in large industry; middle 40's. widower; any locality.

Staff: (i) Medical Degree, Harvard; Board eligible internist; past 2 years, private gen'l practice; seeks indus medicine; excellent references; early 30's; draft exempt; any locality. immed available.

Staff: (j) Excellent residencies, 1 year each, general and orthopedic surgery; since '52 industrial physician, U.S. Arsenal; prefers West Coast. age 32.

Staff or Ass't Medical Director: (k) MD degree, Univ of Maryland, Schl of Med; several years successful private practice; 3 years, plant physician, important company, major industry; (chemicals); while prefers med directorship, small industry, will consider assistantship, if very large company or staff position provided opportunity exists for advancement in short time; excellent personality with good experience in indus medicine; early 40's; recommended.

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Eight-Week Course

POSTGRADUATE Medical School of New York University-Bellevue Medical Center has scheduled a full-time eight-week comprehensive course in occupational medicine for physicians from September 10 through November 2, 1956. Among the subjects offered: organization and administration of an industrial Medical Department; preventive and constructive medicine in industry; occupational diseases; toxicology and industrial hygiene for the physician; as well as biostatistics, communicable diseases control and epidemiology. Opportunity will be provided for attendance at medical, surgical, and clinico-pathological conferences during the course. For further information and application address: Dean, N.Y.U. Postgraduate Medical School, New York 16.

Dental Troubles

DENTAL TROUBLE makes 47,000 workers absent from jobs each day, according to Dr. Bissell B. Palmer, President, Group Health Dental Insurance, first prepayment dental plan in the U.S. Although 95% of population have dental disease, only about 33% receive anything like regular care. A recent survey of an urban employed group showed: Most workers have not visited dentist for two and a half years. Percentage of those who get regular care varies widely on income basis. Only 28% of those earning under $60 weekly visit dentist regularly, while over 38% earning $60 and over do so.

—Industrial Relations News, April 14, 1956.

Executive Health

WHAT ARE companies doing about executive health problems? About 800 of them provide periodic physical examinations at the company's expense. Programs have varying standards for eligibility—including fixed salary minimum ($8,000-$10,000) and executive level. Checkups are usually voluntary, often take four to six hours. Basic examination is given every six months at General Aniline & Film Corporation, New York. Once yearly, executives are urged to have three-day clinic check-up. Officers and division managers get yearly examinations at clinics approved by Metropolitan Life Insurance Company at Westinghouse Electric Corporation. All executives down to assistant departmental superintendents are covered by Inland Steel Company's program, which examines men 45 or over every two years and younger people every three years—with check-ups given more frequently, if necessary. Bills range from $80 to $125 for each exam.

—Industrial Relations News, April 7, 1956.

Anniversary in Milan

THE PERMANENT International Committee on Industrial Medicine was founded in Milan, Italy, June 13, 1906, on the occasion of the First International Congress of Occupational Medicine. In 1956 the Committee will reach its Fiftieth year. To celebrate this anniversary, the President and the Bureau of the Committee have decided to hold a Conference of all the members of the Committee in the same place where, and at the same date when, the Committee was founded 50 years ago. The main topic of the Conference will be a discussion on the past, present and

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future activities of the Permanent International Committee on Industrial Medicine in relation to the development of industrial medicine throughout the world.

WHO on Occupational Health

WHO BULLETIN, October, 1955, has a group of selected papers from two occupational health seminars held in Leyden in 1952, and Milan in 1953. "Occupational health," says the introduction, "is no longer confined to the problems of occupational disease and accidents but has been broadened to cover preventive medicine in industry and all other places of employment." The bulletin contains 17 articles in either French or English, with resumes in the other languages. Pre-employment examinations, sickness absenteeism, mental health, industrial psychiatry, physical capacity, employment, and medicosocial problems of the aging worker, industrial health services in large and small plants, human factors related to accidents, and industry's contribution to rehabilitation each come under review. Included also are summaries, in both English and French, of the discussions at the Leyden and Milan seminars. Like other WHO publications this bulletin is available from the Columbia University Press, 2690 Broadway, New York 27, New York; $2 per copy, $12 per year.

—*Am. J. Public Health*, March, 1956.

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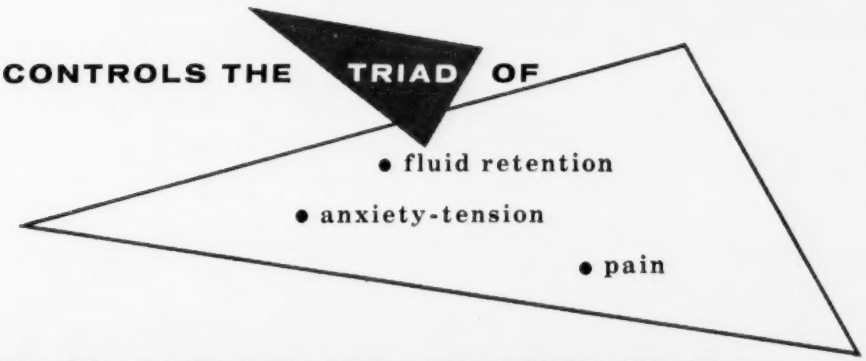

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1. Bender, T. J., Jr.: J.M.A. Alabama 24:217, 1955.
2. Hermann, I. F., and Smith, R. T.: Jl. Lancet, 71:271, 1951.

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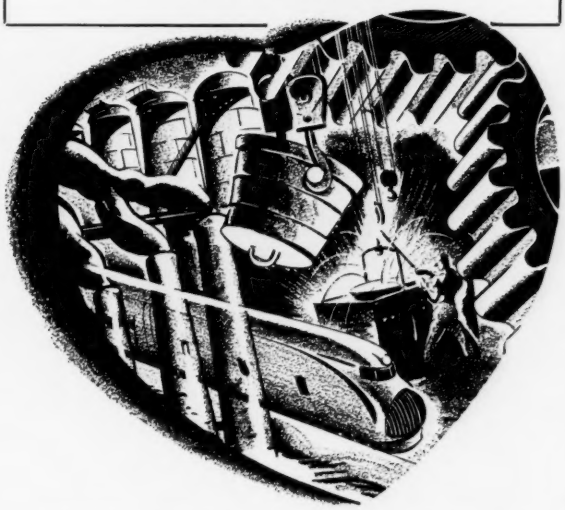

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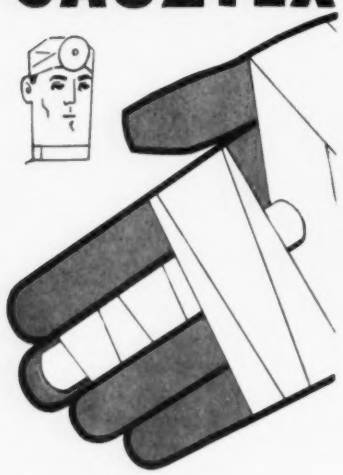

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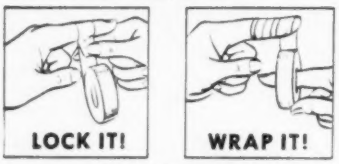

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Ethically promoted RIASOL is supplied in 4 and 8 fld. oz. bottles at pharmacies or direct.

1. *The Dispensatory of the United States of America*, 25th ed., 1955, p. 822.
2. *Merck Index*, 6th ed., 1952, p. 612.
3. *The United States Pharmacopoeia*, U.S.P. XV, 1955, p. 410.

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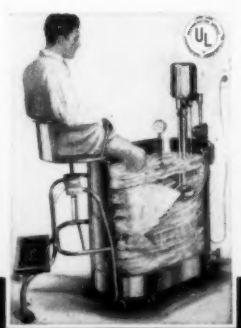

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REFERENCES:

1. J.A.M.A. 159:645 (Oct. 15) 1955.
2. J.A.M.A. 158:386 (June 4) 1955.

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